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COMPUTERWORLD

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HRMS meet personnel data needs

'People are the common denominator of progress . . . no improvement is possible with unimproved people.'
— John Kenneth Galbraith
Economic Development

By John Gallant
CW Staff

A few years ago, an in-house study team at Buffalo, N.Y.-based Marine Midland Banks, Inc. asked company executives to forecast their information requirements into the next decade. One common denominator was the desire for more and better information with which to manage the bank's personnel — its human resource.

"Human resource management information was seen as one of the most important concerns," said William Flannery, administrative vice-president and director of human resource operations and planning for Marine Midland. "We needed much more management-level information to make better use of our people."

Marine Midland already had a personnel system running on an IBM mainframe, Flannery said. But as with many of the personnel or human resource management systems developed in the past, Marine Midland's system consisted of little more than some employee-related records tagged on to an existing payroll processing system. The 300-branch bank maintains information on approximately 19,000 former and current workers.

Because payroll processing is basically a rote function that requires little more than number-crunching power, it was one of the first applications to be conquered by computers. Today, payroll remains a basic component of most sophisticated HRMS. It is offered by vendors either as a module of the full HRMS or as an optional package to be integrated with the HRMS.

But the current generation of large systems human resource software has far outgrown its payroll roots. If you are a newcomer to HRMS technology — also known as human resource information systems — welcome to a new set of buzzwords such as cafeteria-style benefits administration, applicant tracking and processing, skills inventories, position control and compliance reporting.

Founded on integrated personnel data bases, HRMS have become powerful decision support tools designed to help management optimize what many top executives are coming to view as a firm's most valuable asset — its workers.

Proponents claim that, armed with an HRMS, personnel administrators can cut labor and recruiting costs, ensure compliance with new and existing government directives and reduce employee turnover by helping workers achieve their career goals.

See RESOURCE page 23

Site licensing stirs debate at Comdex

By Edward Warner
CW Staff

ATLANTA — When software dealers and vendors met here at the Comdex/Spring '85 trade show last week, the talk was of site licensing — the means by which many corporate software buyers would like to acquire their personal computer software.

Multimate International Corp. detailed a site licensing plan for one of its word processing packages. Borland International's founder, Philippe Kahn, said his firm is already providing site licenses and is currently negotiating others for its Turbo Pascal compiler. Kahn said he favored site licensing partly because of his distaste for most current software licenses, agreements he called "a tax on honesty."

Site licenses, under which several program copies can be made for a set price, free users from worrying about program duplication and often yield more generous discounts than do bulk purchases.

See LICENSE page 11

Enhanced ISN, PBX from AT&T

By John Ott
CW Staff

DALLAS — AT&T Information Systems chose the International Communications Association's Telecom '85 show here to unveil enhancements to its Information Systems Network and low-end private branch exchange.

Enhancements to AT&T's ISN enable the local network to support IBM 3270-type synchronous terminals, Intercessnet Ethernet networks and interface with AT&T Starlan networks. The added capabilities provide for the following:

- IBM 3278, 3279, 3179 and 3179 displays can be directly connected to ISN through twisted-pair wire at IBM standard Type A coaxial rates of 2.35M bit/sec., AT&T reported. Terminal users can dial cluster controllers through ISN and maintain up to two controller sessions. This is said to alleviate the need to dedicate controllers to certain applications.
- Compatible synchronous devices can

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TOP OF THE NEWS

Software vendors were mighty blue with IBM's plan to include two bundled software packages with Personal Computer XT shipments to dealers. Page 2.

■

It may have looked like a carnival, but there was little clowning around at ICA's heavily attended Telecom '85 show. Conference coverage begins on page 6.

Networking products headlined Comdex/Spring '85, along with introductions of net applications software. Page 11.

■

Software maintenance consumes more than half of DP personnel resources, yet most companies do not manage software as a vital asset. Page 16.

■

'208 for the Jobless. The pain of possible DP layoffs resulting from a corporate merger will be eased by a nationwide computerized placement service offered by the merging firms. Page 17.

FYI

Retailer profits from net sales

By Charles Babcock
CW New York Bureau

NEW YORK — The J. C. Penney Co. is finding that the best way to offer computer network services to others is to provide them internally first.

For two years, the retailer has been selling services on its national network through a subsidiary, J. C. Penney Systems Services, Inc. Its first customers have been gasoline retailers that authorize credit purchases and record transactions, much like the chain of J. C. Penney stores has been doing since 1970, company officials said.

Systems Services added 3,000 Shell Oil Co. service stations to the network last year for a total of 3,250 stations. It also brought 450 Gulf Oil Corp. stations online and more recently began a pilot project with Amoco Oil Co. Systems Services added its first banking customer, the 64-branch Zions First National Bank of Salt Lake City, at the end of March, according to Robert A. Mooney, president of the subsidiary.

J. C. Penney is currently optimizing its network by placing IBM Series/1 minicomputers in many J. C. Penney stores. The Series/1 machines will collect point-of-sale data from terminals in the stores and satisfy payroll and other store housekeeping demands. They will also

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NEWSPAPER

IBM ships software with XT

By Rita Bender
and Edward Vitner
CW Staff

ATLANTA — The romance between IBM and personal computer software vendors cooled last week when the industry giant acknowledged plans to ship software with sales of the Personal Computer XT.

IBM will send dealers two software programs free with each Personal Computer XT until the end of July. Each Personal Computer XT with a hard disk drive will be provided with IBM's Displaywrite 3 and a choice of IBM's Topview operating environment or Data Edition file manager. Floppy disk models will be delivered with IBM Writing Assistant and Planning Assistant packages. Dealers may price the software as they wish, IBM said.

Personal Computer XTs sold through direct channels will be shipped with a similar choice of software, according to IBM. An IBM spokesman termed the move "very routine in this industry." He would not say if IBM planned similar promotions for other machines.

Most software vendors said they opposed the IBM plan, although Fred Gibbons, president of Software Publishing Corp., said the IBM effort was nothing new and that it mirrored similar efforts to bundle software by Tandy Corp. and Hewlett-Packard Co. (The Writing Assistant and Planning Assistant are published by Software Publishing for resale by IBM.)

Microsoft Corp. Chairman Bill Gates said the bundling devalues the packages involved in the bundling. Microsoft makes the Personal Computer's operating system, but could lose sales of its word processor to the bundled Displaywrite 3. Gates acknowledged Microsoft's long-term relationship with IBM but added, "the thing about friendship is that it's there (with you) to weather the ups and downs."

> *'When IBM covers up a mistake, they don't care whom they smother.'*
>
> — W. E. Peterson
> SSI Software, Inc.

Camilo Wilson, president of Lifetree Software, Inc. in Monterey, Calif., called the move "predatory" and "inherently unfair."

Like several other vendors, Wilson suggested that IBM had simply moved to clear inventory sitting on the shelves and said he did not expect sales of his firm's packages to be damaged by Displaywrite 3.

Wilson said IBM tried selling the software but that did not work. "They put it on consignment, and that didn't work out. Now they're giving it away," he said.

"When IBM covers up a mistake, they don't care whom they smother," said W. E. Peterson, executive vice-president at SSI Software, Inc. in Orem, Utah. "We hope it's a one-time deal."

"Dealers have to be concerned," said Richard Lefebvre, executive vice-president at Multimate International Corp. in East Hartford, Conn.

"Their margins have been in software. IBM might be testing this for industry reaction," he added.

Wang adds IBM-compatible micros

LOWELL, Mass. — Wang Laboratories, Inc. last week added four machines offering software compatibility with the IBM Personal Computer to the low end of its microcomputer line.

The desktops add IBM monochrome display emulation capability, an existing option, to standard Wang Professional Computer configurations. Wang will promote the systems on the basis of both IBM compatibility and price/performance features, according to Ken Sullivan, Wang director of product marketing.

All models reportedly are available immediately and feature an Intel Corp. 8086 processor, 256K bytes of random-access memory, a monochrome monitor, Wang Advanced Word Processing software, Microsoft Corp. MS-DOS 2.1 and Basic. Expansion slots are compatible with the Professional Computer, not the IBM Personal Computer, Sullivan noted.

The Wang Model PC-PK5, with five expansion slots and two 360K-byte diskette drives, is priced at $3,300. The Model PC-PK6, with five expansion slots and a 10M-byte drive, costs $4,700. The Model PC-PK7, priced at $3,650, features eight expansion slots and dual diskette drives. The Model PC-PK8, with eight slots and 10M-byte hard disk drive, costs $5,050.

IBM micro emulation option

Wang also unveiled an IBM Personal Computer color and graphics emulation option, priced at $575, and an Intel Corp. 8087-2 numeric coprocessor, which costs $300. Both are currently shipping, the vendor said.

Additionally, the price of the Professional's optional 30M-byte hard disk drive was cut to $2,595 from $3,995.

The company also added 19 software packages that run on the Wang Professional in native mode.

More information is available from Wang Laboratories, located at One Industrial Road, Lowell, Mass. 01851.

IBM discount

IBM has sweetened the deal to entice users of its discontinued 4321 and 4331 processors to upgrade to the larger, newer 4361 line of processors with a series of discounted software packages.

IBM is offering users a 33% discount on a group of 53 applications and development programs that include such popular packages as its Professional Office System and PC Bond.

Since early September 1984, when it announced the low-end 4361 Model Group 3, IBM has been offering a discount to 4321 and 4331 users willing to buy upgrade kits to migrate to the 4361 before the end of September 1985.

An IBM spokesman said a similar set of discounted software is currently available to customers who purchase System/36 and 38 processors before the end of this September.

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J. C. Penney found it could reduce the risk of downtime by subdividing its national retailing network and taking down one piece at a time/4

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Burroughs lost its first bid to overturn fraud and breach of contract judgments against it that stem from a lease of its B800/8

CW at Comdex/Spring '85: Some sophisticated applications are on the horizon, but don't expect site licenses for them, according to one computer dealer . . . Compaq Computer's chief executive officer predicted that communications will propel the next drive in personal computing, ushering in an information-access revolution . . . Product debuts and demonstrations here provided a boost for microcomputer networking/10-11

A university's plan to dump a donated Honeywell computer and replace it with IBM-compatible and DEC equipment is causing a flap in Kansas/12

CW at EDP Software Maintenance: A recently revised software applications development cycle at Zale includes maintenance aspects as a key component . . . MIS shops should imitate the software vendors' method of grouping enhancements into applications releases instead of making enhancements one at a time, a consultant advised . . . Software maintenance may consume 55% to 60% of a corporation's DP resources, but software is seldom managed as a vital corporate asset/13-16

The merger between Chevron and Gulf may result in thousands of layoffs, but the companies are helping out the soon-to-be unemployed with a nationwide electronic job-hunting service/17

The American Handicapped Employee of the Year is a systems analyst at IBM's Entry Systems Division in Austin, Texas/18

Former data processing employees of Blue Cross/Blue Shield of Iowa are still hoping to gain redress from their former employer through an $18 million lawsuit/22

A California electric company is using a computer system for everything from managing a nuclear power plant to meter-reading processing/38

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Retailer's tool giveaway prompts suppliers to automate

NEW YORK — The J. C. Penney Co. is giving away a software package in an attempt to get its smaller suppliers to process J. C. Penney orders electronically.

Automatic order processing was formerly reserved for the 500 J. C. Penney suppliers that were large enough to have their own mainframes.

Now, suppliers with resources no larger than a microcomputer and modem can do the same thing, according to the company.

Large suppliers for several years have called the J. C. Penney data processing center in Dallas to retrieve their latest orders from a mainframe file.

Several days savings

Electronic retrieval saves the suppliers the several days that an order formerly spent going through the mail, said Robert Capone, vice-president and director of systems and data processing at the retailer's New York headquarters.

"We've cut 11 to 14 days out of the order cycle," Capone said.

By getting smaller suppliers to follow suit, J. C. Penney can reduce the amount of goods in the order-processing pipeline and get what it wants into its stores more quickly, company officials said.

Runs on micros

The software will run on microcomputers manufactured by Apple Computer, Inc., NCR Corp., IBM or any micro running PC-DOS.

"The fact that we provide the software program gives us some control over the security aspects. We know it's not going to crash our systems," Capone said, adding that the supplier can gain access only to his own orders.

The software giveaway effort began in February, with an initial 300 suppliers given the chance to sample the package. By the end of March, 50 suppliers had the system in use, according to Capone.

J. C. Penney has about 5,000 suppliers, although the 500 largest account for about 75% of the volume of its goods.

— Charles Babcock

J. C. Penney's subnetworks reduce downtime danger

By Charles Babcock
CW New York Bureau

NEW YORK — When J. C. Penney Co. used to take its national retailing network down for maintenance, the retailer's existence hinged upon its ability to bring the net back up.

The hazard was increased by the need to make alterations in a short time on a network that links 55 IBM 3080 series mainframes in eight data centers. The network does all transaction processing for 1,700 J. C. Penney stores nationally, company officials said.

"If you take a large network down, make a lot of changes, and it doesn't work when it comes back up Monday morning, the whole business is at risk," said John M. Dratch, director of data processing and technical support.

However, J. C. Penney has reduced the risk of downtime since last October when it divided the network into four subnetworks and began taking only a fraction of the net out of operation at a time, company officials said.

The national retailer was able to take this step after serving as a beta test site last summer for IBM's SNA Network Interconnection (SNI). SNI allows IBM's Systems Network Architecture (SNA) to be divided into subnetworks that, together, can still be operated as a logical whole.

Two more SNI-divided subnetworks will become operational in June, according to Dratch.

Answering a second need

When J. C. Penney opted for SNI, the IBM product answered a second need of the company. "Our network was so large we were running out of addressing for the devices. That was a primary driving force to move to SNI," Dratch said.

Last year, J. C. Penney was approaching the 65,536 addressing maximum available to it through SNA Vtam, with no slackening in demand for more devices. It now has 86,000 devices online, and by June it will have boosted the previously available addressing by 600%. The increase will come from subdividing the national network into six subnetworks with a total of 393,000 addresses, Dratch said.

The number of addresses is increased because "SNI can distinguish terminal 1 in one network from terminal 1 in another," he said.

Shortly after beta testing SNI at J. C. Penney last year, IBM announced it would offer SNA extended addressing, up to eight million addresses per network, without SNI. Dratch said IBM made no mention of SNA extended addressing when J. C. Penney was considering SNI. Even if it had, extended addressing would not have solved the firm's need to subdivide the network, he said.

When the J. C. Penney network is divided into six parts, a user in one part can communicate with any other part. The boundaries of the subnetworks are invisible to the users, Dratch said.

SNI allows a terminal user in one SNA network to gain access to applications on a host in another network; a terminal user accessing an application in one network can tap into data from another network, said IBM spokesmen in Rye Brook, N.Y.

SNI also allows executive users at J. C. Penney to get information from outside networks, such as the Dow Jones News & Retrieval Service, which supplies news about companies with which J. C. Penney deals, Dratch said.

SNI is a combination of Vtam communications software in the host computer running under the operating system and IBM 3705 and 3725 communications processors running IBM's Network Control Program, Dratch noted.

Because it was a new product, installation of SNI was somewhat drawn out, Dratch added.

"We had to make sure the code worked, the definitions were properly described and coded and the correct routing installed," Dratch recounted. The process began in February 1984 and was completed eight months later, after a few problems were worked out by IBM, he said.

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function as local gateways to the network for Systems Services customers, Mooney said.

Five hundred Series/1 machines will be installed by the end of the year. Another 250 will be in place in 1986, company officials said.

"The Series/1s are justified as in-store processors because they become a node — an entry point — into the network. A customer can ride from there all the way up to the host," Mooney said.

The Series/1s are tied into one of three J. C. Penney data centers, each with its own Systems Services IBM 3080 host computer. The centers are located in Reno, Nev.; Lenexa, Kan.; and Columbus, Ohio. These centers in turn are connected to the J. C. Penney national network through five additional J. C. Penney data centers.

Through special coding, Systems Services traffic is kept separate from J. C. Penney's own retail processing, and if one data center went down, traffic could be rerouted to another, company spokesmen said.

Each host is front-ended by an IBM 3705 or 3725 communications processor running the IBM Network Control Program, said John M. Dratch, J. C. Penney's director of data processing.

The network operates under standard IBM mainframe operating systems, including MVS with Vtam and Systems Network Architecture, company officials said.

"We look at our network as a single logical computer. We established the goal in the early 1970s that any terminal could connect with any computer through this network," Dratch said.

J. C. Penney technicians in the data centers operate the Series/1 machines remotely to avoid the cost of additional staff people in the stores.

A potential customer does not have to be an IBM user to connect to the network, despite its predominately IBM complexion. Any manufacturer that follows the X.25 standard communications protocol can be hooked up, Dratch said.

Systems Services charges 12 cents per transaction — credit authorization and data collection — for a customer supported with leased lines, a fee that drops below 10 cents for some high-volume customers, Mooney said. The fee includes all line expenses beyond the user's modem.

For dial-up customers who do not need a leased line to the network entry point, fees are 6 cents for a credit authorization and 4 cents for data collection, Mooney said.

The following average response times have been recorded this year: 19.6% of transactions were handled in one second; 36.8% in two seconds; 19.9% in three seconds; 8.3% in four seconds; and the remainder in five seconds or more.

Mooney said that credit authorization and transaction processing, the two needs that led J. C. Penney to create a national network, will remain the business core of Systems Services.

But he said that retailers, once they start using a specific service, may find multiple uses in the same way that J. C. Penney is continually finding additional uses for its net.

Once sales data is collected, they can be analyzed to reveal what goods are selling best in what locations. Or the network can be used for messaging between far-flung sites, Mooney said.

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SSI

Packet-switching nets grab center stage at conference

CW AT TELECOM '85

By Paul Korzeniowski
CW Staff

DALLAS — Packet-switching networks were highlighted at Telecom '85, a conference here last week sponsored by the International Communications Association.

Harris Corp. has entered the packet-switching market with Sopho-Net, based on Philips Export B.V.'s European packet-switching product. The wide-area network reportedly connects a variety of X.21 and X.25 networks and is based on the International Standards Organization's Open Systems Interconnect model.

Sopho-Net supplies three types of nodes: an 8- to 24-port node, a 64-port node and a 164-port node. Each port can operate at 72K bit/sec.

The system will transmit up to 1,500 packet/sec., and transmission time is less than 20 msec, a spokesman said.

The network is said to support various media, including satellite, fiber optics, microwave, leased lines and private lines. The system reportedly features full-duplex operation, data encryption capability and two-level password protection.

An eight-port system costs $20,000.

Harris is located at 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

BBN Communications Corp. has added C/300 Packet Switching Node (PSN) to its line of packet switches. The product features throughput of up to 900 packet/sec. and up to 64 access ports.

CS/300 PSN uses custom-designed gate array chips, high-density memory and a single-board design, the vendor said. The product reportedly is software compatible with the C/30 PSN, BBN's other switch, and accepts C/30 host and packet assembler/disassembler interfaces. A typical configuration costs $90,000.

BBN also has announced the T/1000 Digital Resource Exchange (DRX), a T1 line multiplexer. The product supports up to 96 synchronous, 192 asynchronous or 96 voice ports and transmission speeds up to 1.9M bit/sec.

The product is said to reroute failed circuits automatically. T/1000 DRX includes alarm reporting, line monitoring and diagnostic capabilities. System, point-to-point or network loopback testing is provided, the vendor said.

The product can be integrated into a BBN packet-switching network. T/1000 DRX provides digital bypass with drop and insertion and dynamic bandwidth allocation.

T/1000 DRX prices range from $50,000 to $60,000.

BBN is located at 70 Fawcett St., Cambridge, Mass. 02140.

Statistical multiplexers

Racal-Milgo, Inc. has announced three statistical multiplexers: Omnimux 82, Omnimux 162 and Omnimux 322.

The products support single- and dual-link and widebase applications. The multiplexers work with asynchronous and synchronous communications at transmission speeds ranging from 50 to 19.2K bit/sec.

Protocols supported include bisynchronous, Synchronous Data Link Control and Hasp.

Omnimux 82 costs $2,002, Omnimux 162 costs $4,008, and Omnimux 322 costs $5,966. The optional front panel costs $300.

Racal-Milgo is located at 1601 N. Harrison Pkwy., Sunrise, Fla. 33323.

CW AT TELECOM '85

Ramblings from the floor of last week's International Communications Association annual Telecom '85 conference:

■ Intracompany communications needs will be met in the future with a troika of technologies, according to Ken Oshman, president of Rolm Corp. Private branch exchanges such as those manufactured by Rolm offer universal availability for occasional data users; local networks will be employed within departmental work areas where high-speed data bursts must be accommodated; and direct peripheral-to-host cabling will be retained for heads-down data users, Oshman said.

■ Oshman also claimed that in two years Rolm has sold 500,000 digital telephones. This number indicates the growing acceptance of voice and data integration.

Heide Toffler, wife of author Alvin Toffler, asked Oshman if life at Rolm had changed since IBM purchased the communications company. Oshman reportedly said, "My aunt once told me if you can't say anything good about a situation, just say that it's different."

■ Wang will announce a Computer-to-PBX Interface (CPI) within the next six months, according to a Wang spokesman. While Wang will initially back the CPI interface championed by Northern Telecom, Inc. and Digital Equipment Corp., the spokesman said that through software coding changes, the interface may also support AT&T Information Systems' Digital Multiplexed Interface (DMI). This coding technology — which may be patented by Wang — would enable Wang to use the same hardware interface with either the CPI or DMI T1 signal formatting techniques.

■ IBM's Cabling System is virtually identical to AT&T's wiring system but costs five times as much, according to Bob Fleming of the Gartner Group, Inc., a market research firm in Stamford, Conn. In an ICA session on local networks, Fleming called the IBM Cabling System expensive and bulky and predicted that IBM would eventually use standard twisted-pair wire instead of the shielded twisted-pair used in the system today.

In a concurrent session, H. Michael Braude, also of the Gartner Group, predicted that the first products IBM will support with its promised token-ring network — which will be laid over the Cabling System — will be Personal Computers, System/36 minicomputers and 3274 controllers.

Written by CW staff members John Dix and Paul Korzeniowski.

AT&T from page 1

be interconnected using IBM's Binary Synchronous Communications (BSC) or Synchronous Data Link Control (SDLC) protocols through an ISN transport interface that uses data compression. Half-duplex speeds up to 9.6K bit/sec. for BSC are supported, and half- or full-duplex communications at speeds up to 19.2K bit/sec. are possible with SDLC.

■ Ethernet-type IEEE 802.3-compatible local networks can be interconnected using ISN. ISN is said to terminate layers one and two of the International Standards Organization's network model at 10M bit/sec. It is also said to enable communications between devices that use the same higher level protocols, such as Xerox Corp.'s XNS, the U.S. Department of Defense's TCP/IP or the protocols used with AT&T's 3BNet.

■ AT&T's Starlan personal computer network can be interfaced to ISN at its 1M bit/sec. operating speed. The Starlan interface is said to provide a bridge service between Starlan clusters as well as provide Starlan access to ISN resources.

AT&T also announced its Inter-Premises Trunk ISN capability. This feature is said to enable ISN packet controllers to be interconnected using digital transmission facilities — like AT&T's Dataphone Digital Service and Accunet — at 9.6K bit/sec., 56K bit/sec., 64K bit/sec., 1.54M bit/sec. or 2.05M bit/sec.

The ISN features will be available for delivery in the second and third quarters of 1986. Prices will vary according to applications. A system used only for asynchronous applications will range in price from $350 to $550 per port, AT&T said. Price per port for an ISN that is primarily supporting Starlan applications and Ethernet bridging services will range in price from $600 to $800. An ISN primarily supporting synchronous terminals and BSC and SDLC will cost from $1,000 to $1,300 per port.

Enhancements made to AT&T's System 75 PBX include increasing the maximum number of lines the device can support from 400 to 800.

AT&T also announced Automatic Alternate Routing, a feature said to provide the least expensive available routes for private network calls.

The System 75 is said to be able to support T1 links through AT&T's Digital Multiplexed Interface and also be able to interface with ISN.

Using a concurrently announced device called the 3270 Data Module — which can also be used on AT&T's System 85 — the System 75 can support IBM 3270-type terminals.

The data modules come in three models: the 3270T, which costs $785, connects terminals to a System 75 or 85 over standard four-pair telephone wire; the 3270A, at $995, operates either synchronously for standard 3270 support or asynchronously to enable a 3270 terminal to emulate an AT&T 4410 or Digital Equipment Corp. VT100 terminal; and the 3270C, at $1,600, is used to connect 3270 cluster controllers to the PBXs.

In a related announcement, AT&T said its Premises Distribution System (PDS) is generally available. Wang Laboratories, Inc., Hewlett-Packard Co. and Xerox have all reportedly announced support of PDS.

AT&T Information Systems is located at 100 Southgate Pkwy., Morristown, N.J. 07960.

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Random access

Gincom Systems, Inc. this month will announce Release 5.0 of its Control Manufacturing System, an enhanced version of what was formerly known as MRPS Version 4.1. Renamed, repackaged and with new features, the product will consist of eight modules, the foundation of which are Cincom's Bill of Material and Routings and Material Control modules. Enhancements to the system will include integration of Cincom's Mantis fourth-generation language, as well as improved security and text management facilities. Prices for the Control Manufacturing System modules will range from $25,000 to $90,000, depending on the operating environment.

The announcement is said to be the first of several applications-related products Cincom will unveil this summer. Also slated for announcement will be a Cost Management Module, an Accounts Payable Module and Release 2.0 of Cincom's Accounts Receivable package. Other product announcements expected from Cincom include Version 1.3 of its Ultra relational data base management system for Digital Equipment Corp.'s VAX computers. The enhancement will allow the product's relational processor to support DEC's RMS.

■

Did Big Blue redraft a report on VDT safety? IBM is miffed over a news story on an IBM-commissioned study of potential VDT health hazards. The article in the New York-based newsletter "VDT News" quoted scientist Arthur W. Guy's report as saying it is desirable to shield older VDT screens. When IBM released the report it included a preface from Guy dated April 18, after the VDT news story was printed. In that preface Guy said that unshielded VDTs are not a health hazard. Released last year, a summary of the VDT report said that although there is an evidence linking VDTs to health problems, scientists found the intensity of the magnetic field emitted from terminals is similar to those fields in previous experiments that altered the development of chicken embryos [CW, Oct. 29].

■

Computervision Corp. next week is expected to unveil Caddsconnect, an Ethernet interface, according to an informed source. The interface will allow users of its computer-aided design and manufacturing system to access Computervision data bases from multivendor systems. Sales and performance of Computervision's first networking product, Computer-Aided Design and Drafting-Access System, were disappointing, the source noted. Volume shipments of Caddsconnect are expected to begin soon.

■

A group of 210 former Hoffmann-LaRoche, Inc. employees, including former MIS staff members, have charged age discrimination against their former employer in a class action suit filed in U.S. District Court in Newark, N.J., last week. The employees were among those let go Feb. 4 in a staff cutback at the New Jersey pharmaceutical firm [CW, May 6].

■

The expected arrival at this summer's National Computer Conference of Encore Computer Corp.'s 32-bit superminicomputer family will feature Cmos technology rather than the transistor-to-transistor or emitter-coupled logic of existing mid-range processors. The Wellesley Hills, Mass.-based hardware vendor plans initially to build its AT&T Unix-based multiprocessor system series around National Semiconductor Corp.'s 32032 chip. Dubbed Multimax, the supermini will debut alongside a software development system and a series of workstations, the company said.

Micro's niche undefined in communications nets

CW AT TELECOM '85

By John Gix
CW Staff

DALLAS — Where and how the personal computer fits into the corporate communications network remains an unsettled issue for many large companies.

Incorporating micros into the mainstream data network is so involved that one company contacted here on the floor of the International Communications Association Telecom '85 show said it was trying to limit microcomputer use.

Companies providing micro access to corporate data resources are doing so through terminal emulation, attendees concurred. "We have several hundred [personal computer] users, and they want to hook in and be able to talk to the host and [to] each other," said Cort Hessler, network engineering manager at Martin Marietta Data Systems, Inc. in Orlando, Fla.

'The shocking part'

"The shocking part is how fast the end user became aware of the capabilities" and started requesting host support, Hessler said. Demand outstripped Martin Marietta's ability to keep up with user requests for support. The company now uses protocol converters that look like IBM 3270 control units, each unit providing terminal emulation for eight to 14 attached micros, Hessler said.

The company is now studying the feasibility of using value-added network services that provide protocol conversion to support remote personal computers as 3270-type terminals. By using intelligent network services, the company reduces the burden on its own network, Hessler said.

Use of network services may also help performance. Although the shared protocol converter/controller provides better economy than putting emulation capabilities in each micro, file transfers can bring the converter to its knees, Hessler said. Some users identified a growing need to recognize personal computers as processors instead of just terminals. Such is the sentiment at Brown & Root, Inc., an engineering and contracting firm in Houston, which has more than 100 personal computers in its corporate network, according to Lee Lemaire, manager of data communications.

The personal computers now supported by Brown & Root emulate 3270-type terminals. They are connected through a 3274 controller to IBM dial-up Synchronous Data Link Control host ports. The company is testing an IBM product enabling Personal Computers to be recognized as processors within IBM's Systems Network Architecture.

Although this capability would increase the functionality of micros in a network, other dangers do exist, other users warned. "The problem with using personal computers as distributed processors is that you will need more communications power, additional storage and some way to manage [the micros]," noted Stephen Robinson, director of telecommunications and data processing for the state of Nebraska.

The manageability question is of great concern, Robinson said. Once the additional storage required is put at the micro level, there is a risk of isolating information, he noted. Such data concurrency issues necessitate that the user implement control of who can update what files when.

Users content for the most part

Luckily for Robinson, the personal computer users within his purview are mostly content with their spreadsheets and word processing software. "A small percentage of our personal computers turn into communicating devices," he said. Those users who do need host access must demonstrate that need. Typically these users will need current host data — information that has to be manipulated by other users, Robinson indicated.

Martin Konrad, vice-president of communications systems at E. F. Hutton & Co. in New York, echoed some of those sentiments. "We try to keep the population of personal computers down," Konrad said. "We find personal computers difficult to control and difficult to provide with data base access."

Instead of micros, E. F. Hutton is trying to mimic typical personal computer capabilities through shared-logic systems. Using Data General Corp. MV4000 minicomputers and DG's Comprehensive Electronic Office System software, E. F. Hutton is able to provide the standard fare of word processing and spreadsheets while retaining access control to the company's distributed data bases, Konrad said.

Burroughs loses bid in B800 case

SAN FRANCISCO — Burroughs Corp. has lost its bid to overturn the verdict and obtain a new trial in a case in which an insurer was awarded $800,000 in a fraud and breach of contract suit against the vendor [CW, March 4]. The company said it will appeal the findings in the case, brought by Beaver Insurance Co.

District Judge Thelton Henderson of the U.S. District Court of Northern California here denied Burroughs' motions contesting the $785,300 fraud portion of the award, said Richard Perez, trial counsel for Beaver. Burroughs did not challenge the $14,000 breach of contract portion of the award, Perez said.

The case stemmed from charges by Beaver that Burroughs committed fraud and breach of contract when it leased a malfunctioning B800 minicomputer to the insurance company, a spokesman said.

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AT&T rate hikes driving users to examine options

By John Gix
CW Staff

DALLAS — Customers still prefer AT&T Communications' end-to-end private-line services. But short-haul AT&T rate hikes, coupled with increasing local telephone company tariffs, are encouraging users to study their options.

That was the collective opinion of telecommunications managers polled at Telecom '85, sponsored by the International Communications Association here last week.

Most managers agreed that procuring end-to-end leased circuits from AT&T is more manageable than trying to coordinate the installation of local circuits separately from the AT&T long-distance portion.

AT&T's new private-line rate structure breaks out local and long-distance cost components, but seeing where the money is going does not, by itself, sway users away from AT&T end-to-end service.

"We'll still use AT&T end to end because it's easier to manage and simplifies circuit provisioning," noted Bill Perkins, director of airline communications with Trans World Airlines, Inc. (TWA) in Kansas.

'You have to jump in the middle'

TWA still maintains logs of circuit numbers for both the local and long-distance segments of its leased lines, even though the entire line is AT&T's responsibility. Once in a while "you have to jump in the middle" between AT&T and the local companies, Perkins said. "With the circuit numbers, you can go to the local companies [even though it is AT&T's responsibility] and expedite circuit repairs."

Irving Trust Co., a financial services company in New York, will also continue to rely on AT&T's end-to-end service. That decision, however, hinges on which company gives the best service, explained John Compitello, vice-president of telecommunications, voice planning and control.

Admitting that cost affects the decision, Michael Taussig, communications manager of a New York-based consumer products company he would prefer remained anonymous, said AT&T end-to-end service is currently worth the money. Users that try to do away with end-to-end AT&T service must incur the cost of engineering the circuit and must coordinate its installation and maintenance with AT&T and the local telephone companies involved.

The manpower this requires makes users less likely to take matters into their own hands, even when faced with AT&T's rate hikes for short-haul private lines. Irving Trust's Compitello said he expects AT&T's short-haul rates to go up 10% to 15% and New York Telephone Co.'s local rates to go up 8% to 12%, but he is, for the meantime, resigned to that fact. "You have to conduct business as usual.

"Once the rates are firm and you have time to analyze them," Compitello said, "you can evaluate your options." This process typically takes six months. Options available include installing T1 links and bypass facilities, he said.

Another option is to use Wats lines. John Hildebrandt, corporate manager of telecommunications for Warner-Lambert Co., a health care and consumer products company in Morris Plains, N.J., said that because of short-haul circuit rate hikes he will probably use a Wats line to replace a current private line.

Hildebrandt said his company will closely study short-haul circuits but noted that bypass is "still a little too expensive for us."

As rates increase, however, the available options become more viable, Taussig said local rates for a typical voice-grade leased line may go from $276/mo to more than $400/mo. Because of this, he is installing a local T1 link that will carry voice, data and video traffic between two of his local facilities.

Reaction depends on requirements

How users will react given escalating rates depends on their particular requirements, their geographic locations and their relationships with the telephone companies involved, noted John Costello, corporate telecommunications manager for Ex-Cell-O Corp., a company that makes automotive and aerospace products.

There is no easy way to pinpoint when, where and how options can be exploited, Costello said. "Bypass, for example, depends solely on the circumstances of a given requirement at a given time." For his own part, Costello "doesn't see using bypass in the near future."

Some users have a fatalistic but optimistic opinion of rate hikes such as those being planned by AT&T and the local telephone companies.

TWA's Perkins said local rates are bound to go up as the industry moves to cost-based pricing. The silver lining to the cloud, he noted, is that as local rates come into line with carrier costs and the system gains equilibrium — after being skewed for so long by AT&T's cross-subsidization of the local companies — overall communications costs will go down.

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Vendors cool to site licensing, look for alternatives

Ashenpin, left, and Wagman

CW At Comdex/Spring '85

By Edward Weaver
CW Staff

ATLANTA — The future looks bright for such applications as expert systems, natural-language data base interfaces and micro-to-mainframe communications packages, according to a major personal computer software distributor who spoke here last week at Comdex/Spring '85.

Corporate software buyers, however, should not expect to be able to purchase site licenses for those or any other best-selling package, according to David A. Wagman, chairman of the board of Softsel Computer Products, Inc. Under site licensing agreements, first popularized in the mainframe software industry, buyers pay a set price for the right to make copies of a program.

Site licensing no problem

Wagman said site licensing was no problem when vendors' representatives were at the user's site each day to maintain the software and ensure that the license was not violated. "There isn't an equivalent today. How can you site-license 4,000 machines and be sure [the software] isn't [really being used on] 4,500 [machines]?" he said.

Wagman, who made his comments as part of a panel presentation, said major software publishers will resist site licensing and will instead offer volume discounts to corporate users. Softsel, he added, supports the hardware-locking scheme for software protection proposed by the Association of Data Processing Service Organizations, Inc.

In the area of expert systems software, Wagman said, users can expect to see the arrival of sophisticated how-to programs that take user input and provide suggestions on how to solve a specific problem. For the DP manager this could mean the development of a program such as "How to Fine-Tune MVS on Your IBM 3783." Wagman also suggested that software incorporating the principles of artificial intelligence might one day produce applications tailored to the way individual users work.

Wagman, whose Inglewood, Calif.-based firm publishes the "Softsel Hot List" of top-selling personal computer software, also advised his listeners that several types of software are headed for flat or declining sales.

He predicted growth, however, for corporate software resellers, who, he said, use their low overhead to compete largely on price but who "are generally well respected for their technical knowledge."

Another panelist, Egil Juliussen, predicted the rise of another means of software distribution: downloading software directly to a user's micro. Juliussen is chairman of the board of Future Computing, Inc., a Dallas-based research firm.

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Compaq exec sees push to communications coming

CW At Comdex/Spring '85

By Eric Roeder
CW Staff

ATLANTA — Although communications today is a relatively weak force in personal computing, it will be the industry's next major push, predicted Rod Canion, president of Compaq Computer Corp. "We're about to see an information-access revolution."

In a keynote address here at Comdex/Spring '85 last week, Canion noted that "communications is in its infancy and fogged with skepticism because of all the babble about [electronic mail, local-area networks] and new technology.

"But it must be realized that communications is a means to an end, a tool just like the personal computer is a tool, and we have yet to see its real importance emerge.

"The reason a personal computer user can live without communications today is because in the general business market one's competition isn't using communications either," Canion said.

Single standard not seen

Unlike the case in microcomputer hardware, where there is a dominant industry standard, "it doesn't seem that there will be a single standard in the family of communications hardware," Canion noted. "The primary standard in this area is most likely to be in software — a standard interface to the industry-standard personal computer architecture that supports the wide range of communications hardware alternatives needed."

Meanwhile, Canion maintained, the hardware standard built around the IBM Personal Computer will continue to grow in strength. "It is now clear that the game is over for those refusing to adopt the industry standard," he said.

Canion also downplayed reports that IBM will shut down its open architecture. "If IBM were to come out with architecture that wasn't compatible with the existing standard, it would itself be starting from scratch and thus starting even with [Apple Computer, Inc.]. AT&T and anyone else in trying to set a new standard," he said.

"The standard created by IBM is in fact now independent of IBM," Canion claimed. "The industry today involves millions of users and thousands of companies that are dependent on maintaining that standard.

"And, in the end, what's good for the standard is good for IBM," he added.

NEWS

Micro network products command Comdex spotlight

CW AT COMDEX/SPRING '85

By Rita Bowler
CW Staff

ATLANTA — Personal computer networking took a high profile at Comdex/Spring '85 here last week, with a flurry of demonstrations and product debuts — including many additions to the fast-growing crop of network application software.

In one of the first moves by a major supplier of microcomputer applications software, Multimate International Corp. announced local-area network versions of its Multimate word processing packages for IBM, 3Com Corp. and Novell, Inc. networks. Richard Lefebvre, executive vice-president of Multimate, commented that "the installation of local-area networks among our corporate customers has increased dramatically in the past year."

> "The installation of local-area networks among our corporate customers has increased dramatically in the past year."
>
> — Richard Lefebvre
> Multimate International Corp.

The cost of a three-user license for Multimate 3.3 is $995, with licenses for additional users priced at $195 each. Multimate is headquartered at 52 Oakland Ave. N., East Hartford, Conn. 06108.

Lotus Development Corp. officials, meanwhile, pointed out that the upcoming release of its Symphony multifunction package will be able to address shared print resources and shared files on a local-area network. Lotus said it also has updated its licensing policy to permit a single copy of the package to run on a network, as long as a key disk and documentation are present at each workstation.

Other major players that are not yet offering network software underlined their plans to move in that direction. "We're making the transition from single-user to multiuser," said Edward Esber, president of Ashton-Tate. "Networks are very important for use in the corporate market."

The tricky issues raised in pricing network software make price the largest obstacle for a host of software firms poised to enter the networking arena during the next few months, industry executives pointed out.

Among other network developments at Comdex/Spring '85, 3Com introduced an IBM 3270 gateway for its Etherseries networks. The Ether 3270 software package, running on a dedicated IBM Personal Computer or Personal Computer AT, reportedly supports up to 32 host sessions. Users can transfer files to and from the host, and print jobs can be spooled to network printers or network storage, the company said. The package will be offered next month for $1,595.

3Com also introduced Ethermac software, which will link Apple Computer, Inc. Macintoshes on the Appletalk network to 3Com's 3Server network server. Available in June, the software is said to give Macintoshes access to network hard-disk storage, to connect separate Appletalk networks, to permit data sharing between Macintoshes and IBM Personal Computers and to provide spooled printing to Apple's Laserwriter printer.

The Ethermac software includes the Ethershare and Etherprint packages. Ethershare for the Personal Computer and Macintosh costs $695 per server, and Etherprint for the two machines is priced at $395 per server. Ethermac user software costs $50 per user, and the 3Server expansion board (with Appletalk port) costs $625. 3Com is located at 1365 Shorebird Way, Mountain View, Calif. 94039.

Also at the show, Banyan Systems, Inc. introduced enhancements to its Virtual Networking Systems line, including a $995 software package that allows an IBM Personal Computer AT to act as a network server. Banyan is located at 135 Flanders Road, Westboro, Mass. 01581.

Comdex/Spring abounded with networking demonstrations, the largest of which was a joint effort between Novell and Proteon, Inc. that linked 24 exhibitor booths. Wang Laboratories, Inc. also showed its Fastlan, an existing easy-to-install version of Wangnet, which the company has now opened up for sale through reseller channels.

Several micro-to-mainframe products also debuted, including Irmalink/Windows and Irmax Graphics from Digital Communications Associates, Inc.

Running on the firm's Irma terminal emulation board, Irmalink/Windows reportedly provides IBM Personal Computer users with simultaneous microcomputer, mainframe and notepad windows. The package will be available in June for $149.

Irmax Graphics is a hardware/software combination said to enable an Irma-equipped Personal Computer to function as a 3270 Personal Computer. Irmax Graphics is compatible with IBM's host-based Graphical Data Display Management system and operates in a Systems Network Architecture teleprocessing environment, the vendor said. The product also permits the micro to act as an IBM 3270 SSG or SSG monochrome terminal or as an IBM 3270 SSG or SSG color terminal.

Irmax Graphics will be available in July for $1,595 from Digital Communications Associates, which is located at 303 Technology Park, Norcross, Ga. 30092.

LICENSE from page 1

Multimate site licenses could offer discounts of $100 or more off the current selling price of the Multimate word processing package, according to Richard Lefebvre, Multimate's executive vice-president and chief executive officer.

A site license for 1,000 copies of Multimate would be priced at $170,000, he said.

Multimate said that the minimum quantity for a site license would be 500 copies.

Reactions varied

Reactions at the show to the site licensing concept were varied. Analyst Esther Dyson, president of Edventure Holdings, Inc., said she supported site licenses because "eventually the large buyers are not going to buy [software] copy by copy."

Software vendor Fred Gibbons, president of Software Publishing Corp., said that he felt most corporate users were looking for simple bulk discounts, rather than true site licenses.

Gibbons said that software packages are usually bought in small, low-cost quantities. He said that he found it difficult to believe that any corporate personal computer user has the authority to spend $10,000 to purchase a companywide software license.

Personal computer software publisher Joseph Seidler, president of Analytica Corp., went even further, saying that if site licensing were to become popular, "I don't see how we could stay in business."

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University of Kansas looking gift horse in mouth?

System donor miffed by replacement plan

By Donna Balmond
CW Staff

LAWRENCE, Kan. — The University of Kansas' bid to upgrade its computer center is taking some heavy fire from Honeywell, Inc., donor two years ago of a DPS 8/20C system that will be unplugged to make room for the school's new computers.

The university will disconnect a donated 1.2 million instructions per second (Mips) Honeywell DPS 8/20C machine that runs under Honeywell's CP6 operating system to make way for a Digital Equipment Corp. VAX series or compatible system for academic and research uses and an IBM or compatible 4381 Group 3 machine for administrative purposes, said Richard Mann, director of information systems at the school.

> *'It is impossible to understand the rationale behind unplugging a donated computer and replacing it with purchased equipment.'*
>
> — Honeywell, Inc.

The plans have led to editorial salvos fired in the local press, which claimed that there has been "a long-time effort by IBM officials to tie up most state computer business and eliminate any other systems."

'Disappointed with decision'

"Honeywell is very disappointed with the university's decision to disconnect the donated Honeywell equipment," a Honeywell spokeswoman read from a prepared statement. "It is impossible to understand the rationale behind unplugging a donated computer system and replacing it with purchased equipment at greater cost. Evidently, the university's decision is to limit computers to those of one dominant supplier without competitive bids. Honeywell does not believe the university or the state of Kansas is best served by this decision."

According to Mann, the "dominant supplier" comment is not valid, and Honeywell is making a bigger flap than need be. "We originally proposed bringing in a big IBM-compatible mainframe and sharing it between the administrative side [which is IBM] and the academic side [Honeywell]" so users would have both Honeywell and IBM access, he said. The faculty vetoed that idea, however, saying that they wanted access to VAX machines, he said.

The university plans to keep a 2.2 Mips Honeywell DPS 8 system that runs under Honeywell's Gcos operating system, which it purchased from the vendor six years ago, Mann said. The school plans to keep the system at least until it is paid for in 1987.

The proposal was changed to include a VAX 8600-type machine for academic computing and an IBM 4381 Group 3 equivalent for administrative tasks, Mann said. An old, paid-for IBM left from the administrative center will be brought into the academic center for statistical applications, and the Honeywell DPS 8 will remain.

'We had to make a choice'

"The problem was I didn't have enough money to do that and also continue to run the smaller Honeywell," Mann said. "We had to make a choice," and faculty users decided against the DPS 8/20C machine, he said.

The university wants something in the 4 or 4.6 Mips range that can run DEC's VMS operating system and is compatible with DEC's software, he said.

Everything the faculty needs does not run on Honeywell's operating systems, Mann said, and even software packages that do run on them have to be converted. SAS Institute, Inc.'s SAS package — a popular statistical package among academic researchers — will not run on the big Honeywell system under Gcos, for example, he said. The university has other statistical packages under Gcos but cannot offer enough diversity to its users with the Honeywell systems, he said.

"If I had $100,000 a year, I'd put it [the Honeywell DPS 8/20C] up. I have no problems with that — I like the machine," Mann said. He said he plans to put it up as soon as possible, probably in a year.

In the meantime, bids have gone out to IBM, National Advanced Systems Corp., Amdahl Corp. and other IBM-compatible companies as well as to DEC, Mann said.

One of the third-party vendors has an excellent chance of receiving the IBM or compatible portion of the contract, he said, because it tends to charge less than IBM, and because Kansas is bound to choose the lowest bid for the systems and services required by the university.

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Retailer's development cycle emphasizes maintenance

CW AT EDP SOFTWARE MAINTENANCE

By John Desmond
CW Staff

DALLAS — Maintenance of applications should become easier at Zale Corp., where a recently revised applications development cycle makes maintenance a key focus.

"The manager of maintenance is also the manager of development" at Zale, according to Kathleen A. Davis, manager of quality assurance for the jewelry retailer headquartered here.

"It's very hard to get developers to focus on what makes an application maintainable. They'd rather talk about nested ifs," she said, referring to a common procedural peeve.

Speaking at the Data Processing Management Association's EDP Software Maintenance conference held here last week, Davis said planning for maintenance in development results in fewer programming bugs. "We want to do it right the first time and not do it over and over again," she said of programming.

A number of maintenance-related problems spurred Zale's management to embark on an eight-month effort to revise its applications development cycle, Davis said. Users were not satisfied, applications support was not adequate, and MIS groups with mutual interests were not communicating, she said. "No one talked to anyone else until things reached the crisis point," Davis said.

Davis

Zale's former development cycle was a rigid system limited to technical aspects that excluded operations personnel and users, Davis said. A major credit system application produced under the old system could not be brought up on time because no one on the development team noticed the absence of a batch processing window, she said.

In the new development process, "The focus of the project is on the business problem, not the technical solution. User participation is not only encouraged, it is required," Davis said. "We decided that to be successful, we had to include everyone."

Broadened definition

The definition of software maintenance at Zale was broadened to include factors such as structural changes required by users, impact on business operations, systems performance constraints and documentation. "Maintenance takes on a much broader scope" in the new process, Davis said. The project manager decides whether the maintenance goal has been satisfied, she said. If the goal has not been met, a management decision is made on whether to implement the application. "As long as they can make an informed decision, it's not a problem," Davis said.

Zale has 12 development projects under way currently and has 56 applications in place. The company has 200 employees in its MIS department, and half of them work in development. One major application being developed is a credit system. "Very few people buy diamonds with cash," Evans noted. Another application under development is a revised payroll system, scheduled to be brought up by Jan. 1.

Zales' calculation of the maintenance implications and complexity of new applications includes the following eight factors:

- Manual recurring dollar impact.
- Target date constraints.
- User impact.
- Divisions affected.
- Changes to existing functions
- New functions.
- Applications system interfaces.
- Support system impact.

Documentation in Zale's development process is negotiable between operations and maintenance personnel, because the company has found that rigid requirements may lead to unnecessary documentation, Davis said. "We want to eliminate binders and things on paper as much as possible," in favor of prompts on the display screens, she said.

The company's development cycle has yielded benefits already, according to Davis. A postimplementation review of an application developed using the old system showed that users were dissatisfied, project leaders were frustrated and operations people were struggling with the application, which was just six months old. "The program code was not exactly spaghetti code, but it was not easy to maintain," Davis said. The programmers used assembler and a hodgepodge of other languages to write the application, which was a sales audit program, she said.

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MIS managers advised to group software changes

CW AT EDP SOFTWARE MAINTENANCE

By John Desmond
CW Staff

DALLAS — To ease the burden of software maintenance, MIS departments should imitate software vendors' practice of issuing new releases of enhanced applications.

So said Paina Kontorovich, a senior consultant with Alexander Grant & Co., a New York-based accounting and consulting company. Kontorovich spoke at last week's Data Processing Management Association's (DPMA) EDP Software Maintenance conference here.

"All the software companies do it; that's the way they make money," she said. "But in the corporate world, we stop thinking in that frame of reference," she said.

The release method of software maintenance is defined as grouping software changes for implementation, instead of making changes one by one, Kontorovich said.

Defining maintenance as changes made to a program after delivery to a user, Kontorovich said her company's figures show that 67% of users' total expenditures for software is spent on maintenance, compared with 33% on development. Error correction accounts for only 15% to 20% of maintenance programming time. The balance of maintenance programming hours are spent changing or enhancing programs, she said.

The consultant and former applications development manager cited improved planning and management, better design of changes, greater control and enhanced testing and documentation as benefits of the release method. Decisions must be made regarding exactly what goes in the release, when changes are made, the priority of changes and the impact of not making an improvement, she said.

CW PHOTO BY JOHN DESMOND

Kontorovich

Carrying out a user-requested software enhancement may involve changing only two lines of code but may still require a rewrite of the program's documentation. "People don't do it," said Kontorovich, noting that documentation suffers as a result.

Sell idea to decision makers

The release idea must be sold to the decision makers in the organization, whether they are users or management types, she said. She advised DP managers to argue that the release method will save on maintenance costs. But one user in the audience was skeptical, commenting that his end users would have to wait longer for enhancements. However, another user pointed out that to implement many changes at once in new release would take less time than to make a series of individual changes.

Ground rules for establishing the release method include the designation of an individual to decide what enhancements are to be included, the timing of releases, emergency maintenance provisions, a testing scheme and change control procedures, Kontorovich advised. In response to a question on how frequently releases should be issued, the consultant advised flexibility.

Begin using the release method on small, simple systems first, Kontorovich said, because the method may not work.

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DATA SWITCH CORPORATION

Xmodems: The right blend?

In today's typical data processing environment, it is hard to find an ideal mixture of hardware and software. With the growing use of AT&T Unix systems for commercial applications, there is a rising interest in personal computer-to-Unix communications for terminal emulation, electronic mail and file/data transfer.

This software benchmark examines two Xmodem communications products designed specifically for personal computer-to-Unix communications: Tango from Computerized Office Services, Inc. and PC Works from Touchstone Software Corp.

Included in the testing was Blast from Communications Research Group (CRG), one of the few non-Xmodem products available on the market today.

The tests were conducted within the Yates Ventures, Inc. laboratory using directly connected computers over a 24-ft cable (20 ft is often used as the safe maximum length for reliable Xmodem data transfer).

PC Works and Tango were tested using a two-drive IBM Personal Computer with 256K bytes of memory and a Zilog, Inc. Z8000/31 microcomputer running Zeus 3.21. The Blast tests involved the same IBM Personal Computer but used an AT&T IS 3B2/300 microcomputer running Unix System V.

The actual time tests involved three executions of a file transfer, and times expressed are averages of those three executions. Additionally, the tests were conducted at 1,200, 4.8K and 9.6K bit/sec. rates using files of 1K, 20K and 100K bytes.

The test results show a lack of variance in transmission speeds, even with a fairly large file (100K bytes). This indicates the need to look beyond mere speed as a criterion for selection.

Reliability more important that speed

Reliability of data transfer is, of course, more important than the speed of transmission. Variances in the number of transmission errors do not, unfortunately, really appear in direct-connect transmissions. Long-distance phone transmissions were tested for Blast and Tango. Because the parameters of this test could not be controlled or measured accurately, the results should only be taken as broad indicators.

With line noise at approximately 20%, Blast had no trouble with transmission of large files. In fact, transmission time was roughly the same as over directly connected lines (22 min for 100K bytes at 1,200 bit/sec.), indicating that Blast's error-correction methods are very efficient.

On three separate tries under the same conditions, Tango's error threshold was exceeded for every attempt to transmit a file larger than 40K bytes.

The difference lies in Blast's transmission protocol. CRG refers to their technique as a "blocked, sliding window" protocol. This means that data is sent in a pipeline of encoded blocks.

The program continues to send blocks of data without waiting for a receiving acknowledgment. When the acknowledgment is received by the transmitting program, blocks that were corrupted can be re-sent out of order. This process allows transmission to be much more efficient under adverse conditions.

As the number of errors rises, Xmodem products must resend corrupted data before new data is sent, greatly slowing down the process.

Propogation delays can also cause great problems for Xmodem products, which must wait for an acknowledgment before continuing transmissions. Blast's sliding window allows propogation delays of up to 2 sec. at 1,200 bit/sec., enabling the product to be used with satellite links, microwave transmission, private branch exchange systems and other links that traditionally create problems for data communications. This qualifies Blast as an "industrial strength" product that can provide reliable, quick transmissions even under conditions that are far from ideal.

> *The difference lies in Blast's transmission protocol.*

Additionally, Blast provides the ability to transmit files simultaneously in both directions, potentially doubling the time savings.

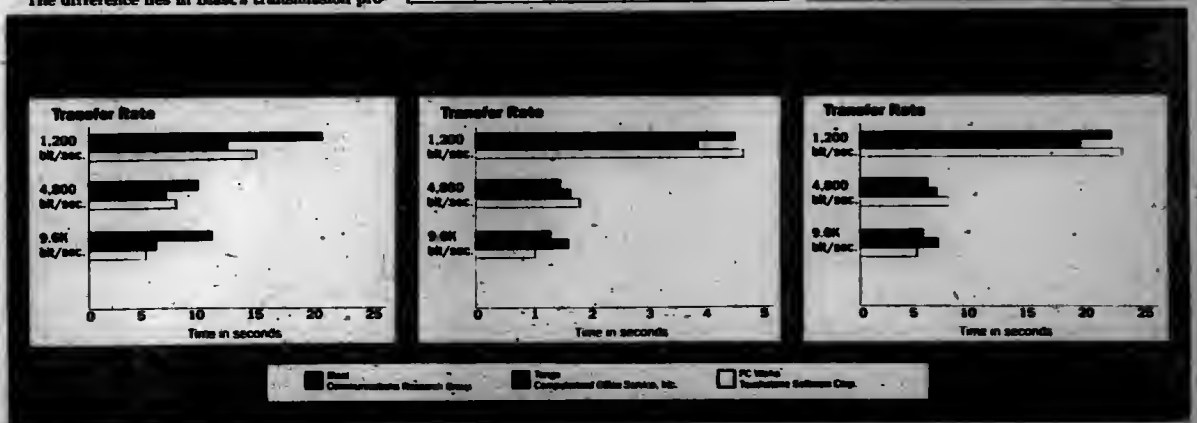
Ease of use and terminal emulation capabilities may be more important for users working strictly with directly connected computers, whereas Xmodem products can provide acceptable performance. These two factors traditionally have been Blast's weak points.

Along this line, Blast now has new documentation and a Digital Equipment Corp. VT100 terminal emulation mode. Terminal emulations supported by Tango and PC Works are listed in Table 2. The Tektronix, Inc. 4041 mode, which Tango supports on an IBM Personal Computer with graphics, was tested and found to work well but slowly.

Although there was little variance overall in transmission times for the three products, Tango's times did not improve from 4.8K to 9.6K bit/sec. This indicates that Tango's error-detection and correction algorithms do not allow the product to take advantage of the higher bit/sec. rate.

ABOUT THE BENCHMARK

Product evaluations, specifications and technical information are provided by Yates Ventures, Inc. Software Evaluation Laboratory Service (Sels), which is solely responsible for their accuracy. More information about Sels is available from Yates Ventures, Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.



Software upkeep seldom seen as vital corporate asset

ON IT EDP SOFTWARE MAINTENANCE

By John Desmond
CW Staff

DALLAS — Despite findings that up to 60% of DP personnel resources are consumed in performing software maintenance — maintenance being any change made to a program after it is delivered — most corporations do not manage software as a vital corporate asset.

That central theme emerged from interviews with users and speakers at the Data Processing Management Association's EDP Software Maintenance conference held here last week.

"The message isn't being communicated to management about the importance of maintenance," said Ned Chapin, consultant with Infosci, Inc. of Menlo Park, Calif. and president of the Software Maintenance Association. "DP hasn't made its case well for maintenance. Software is an asset. We should recognize that and treat it with esteem."

To many DP managers, the way to improve software maintenance is to hire more people to work on it, Chapin observed. The 30-year industry veteran said DP managers often ignore other ways to improve, such as managing maintenance better, investing in more maintenance tools and improving maintenance procedures and methods.

For many companies, finding programmers who enjoy working on maintenance is difficult, users and speakers indicated. According to William Vann, manager of applications development for Avon Direct Response, a clothing firm in Newport News, Va., "Young programmers don't like to clean up somebody else's mess."

The conference's personnel track leader, Paul C. Tinnirello, manager of data services programming for the Oldwick, N.J.-based A. M. Best Co., responded to the comment saying, "That opinion reflects an ever-present attitude in business — 'maintenance, problems, cleaning up a mess — yuk! That's not for me.' "

Tinnirello

A tremendous imbalance often exists between a DP manager's perception of a software system's viability and its actual importance to the company, said Rick Ball, support coordinator of service station automation for Esso Petroleum Canada in Toronto.

Citing an example at his own company, Ball said he was called to Esso's Alberta, Canada, DP site to assess a maintenance problem several years ago. He discovered that only two people were assigned to maintain the terminal automation system; one was a recent college graduate, the other a former operations technician. The automation system controlled the sale of all petroleum products from several Esso terminals, sales representing several billion dollars of company revenue.

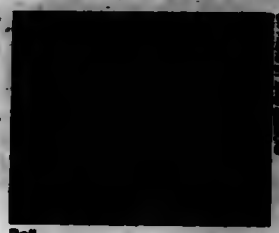
"The company would have gone out of business in a week if it ever went down," Ball said. Since then, he said, Esso has responded and now has a highly developed maintenance program.

Many corporations display a bias toward software development and against maintenance, especially in promotion policies, several speakers indicated. "Development is associated with glamour," Ball said. "It's easier for a manager to talk about some new project than it is to talk about maintaining the viability of a system."

The bias toward development also extends to vendors, according to Jack Parker, manager of business systems support for Burroughs Wellcome Co., a Greenville, N.C.-based pharmaceuticals firm. "The speakers at this conference all said, 'These are the problems,' but I haven't heard many solutions. Vendors are guilty of treating the maintenance process as a no-no. They haven't realized its potential. There is a disparity between the tools marketed for development purposes and the tools marketed for maintenance purposes," Parker said.

One vendor said the market for maintenance tools is a slow one. "We're chafing at the bit because it's moving so slow, not because it's not moving," according to Burton Strauss, a senior consultant with Peat, Marwick, Mitchell & Co.

The view that the tool market is slow is shared by Nicholas Zvegintsov, editor of the "Software Maintenance News" newsletter. "The current state of technology is that a fair number of special-purpose [maintenance] products do solve some problems," Zvegintsov said. "But everybody and his mother-in-law said the big breakthrough will be an integrated system that [solves many problems] in a single interface. There are no such products now."



Ball

More troubling to Zvegintsov than the state of technology is that managers are finding their employees reluctant to use tools, and vendors are finding it difficult to sell tools. The reason, he suggests, is "the cost of using tools is much higher than we care to admit. We're asking the human to do something very difficult to complement the tool. And there is no magic answer."

Perhaps the typical corporate view of software maintenance is that of Richard Gallery, applications project manager at Boston Edison Co. According to Gallery, "When you want to punish someone, put them on maintenance. I don't think management thinks maintenance is anything but a low programmer's job. Maintenance is important. But trying to relate that to someone is another story."

"Ferguson, you have a lot to learn about proxy fights."

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Oil firms provide job data base for displaced workers

By Jeffry Beeler
CW West Coast Bureau

HOUSTON — Two oil industry giants are jointly supporting a nationwide private data base used to find jobs for thousands of employees who may face layoffs as a result of the firms' recent merger.

To create the data base, Gulf Oil Corp. is continually approaching large corporations throughout the U.S. and asking them to furnish details about current job openings. Selected submissions are then electronically stored in a Chevron Corp. data center built mainly around IBM 3081s.

If Gulf or Chevron employees are subsequently displaced and want to find a new job, they can log on to the centralized data base through on-line terminals installed in more than 20 cities.

Can call up a list of jobs

Using a Gulf-written screen format, the employees can extract a list of all the reported openings that lie within a designated job category, according to Jay Stright, Gulf's director of professional recruiting and placement. Other report formats, meanwhile, allow users to sort the listings by salary level or geographic region, he said.

Although Chevron has promised jobs to all Gulf employees who are willing to relocate to California, many of the workers are expected to reject the offer (CW, March 4). Those who refuse to move may therefore find themselves out of work.

The prospect of mass layoffs concerns Gulf, which has long prided itself as being a "leader in state-of-the-art outplacement services," according to John Knudsen, the firm's general manager of human resources. Several months ago, with funding from Chevron, the company began to create a solution.

The result of Gulf's and Chevron's cooperative effort is a package of employee outplacement services that includes secretarial support, training in basic job-hunting skills and a system for distributing resumes to prospective employers. All the elements of the placement program are available through a string of resource centers that Gulf has opened in 21 U.S. cities.

Confidential-search data base

Also accessible through the resource centers is a confidential-search data base, which keeps records of all the employees who agree to participate in the job-hunting program and are eligible to do so, Gulf's Stright said.

The centerpiece of the oil companies' placement plan is the nationwide private data base, which lists some 6,000 search firms and 18,000 hiring specialists as well as job openings, he said.

Raw material for the data base comes primarily from direct mail and telemarketing campaigns, which seek information about potentially suitable job openings in Fortune 1,000 firms. To a lesser extent, the data base also relies on toll-free hot lines and newspaper advertisements for its contents, Stright said.

Although it is unable to support ad hoc queries, the menu-driven data base does give users a choice of five report formats, Stright said. One of the reports provides summary listings of openings within 15 broad job categories and many subcategories. Another format allows users to focus on individual listings within a summary report and request additional details about each. A third indicates what jobs are available within a specified geographic area, while a fourth sorts the listings according to the user's salary requirements. The remaining report lists only the openings that have entered the data base since an employee's most recent logon.

Because merger-related layoffs within Gulf and Chevron have yet to begin in earnest, the effectiveness of the job-search data base is still difficult to gauge with certainty, according to Knudsen. But before the job placement effort is finally dismantled, the data base is expected to generate several thousand new jobs for displaced Gulf and Chevron employees, he said.

Education focus of DPMA meet

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) will hold an Information Systems Education Conference Oct. 26 to 27 at the Sheraton Houston Hotel.

The program will consist of more than 60 presentations and panel discussions for computer systems educators, undergraduate instructors and students. Topics to be discussed include educational software, delivery systems and productivity, the impact of technology on professionals and computer-aided instruction.

Registration before Sept. 2 is $110 for DPMA members and $130 for nonmembers.

The DPMA Education Foundation is located at 505 Busse Highway, Park Ridge, Ill. 60068.

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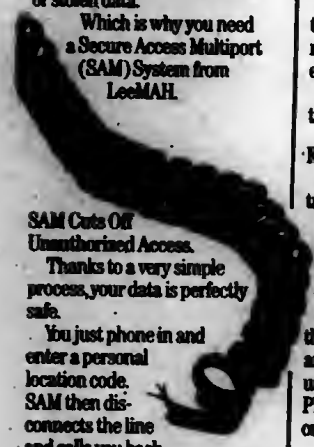

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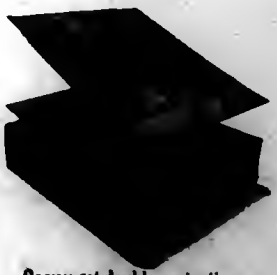

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NEWS

Disabled IBM analyst wins award

By Susan Raimondi
CW Staff

AUSTIN, Texas — The American Handicapped Employee of the Year for 1985 is a systems analyst at IBM's Entry Systems Division here.

James Caldwell has degrees in mechanical engineering and a doctorate in business from the University of Texas at Austin. Since 1979, he has been employed as a jack-of-all-trades in the development lab, Caldwell said. Currently, most of his time is spent acting as a liaison for technical and business con-

Caldwell

cerns between vendors and IBM researchers who are designing and building unannounced products for the IBM Personal Computer.

In 1962, Caldwell's career as an underwater engineer ended in a fire. "I lost 70% of my skin, and complications [resulting from] the fire caused central nervous system damage," he said. The results were total blindness and paralysis below the waist. He returned to school for his doctorate, because at that time few companies would hire handicapped people and he wanted to be more employable, he said.

Caldwell works on an IBM Personal Computer, which he said is an ideal tool for handicapped people by virtue of its software operating system. The I/O is software controlled, so extra equipment like braille printers and voice synthesizers is easy to add, he said.

The award was presented on May 8 at a meeting of the President's Committee on Employment of the Handicapped in Washington, D.C. It honors Caldwell for his employment record and his dedication to helping others.

Caldwell is on the board of the mayor's committee of employment for the handicapped and helps handicapped people put together devices they need to work more productively.

WASHINGTON UPDATE

NTIA chief pushes concern for telecom users' needs

WASHINGTON, D.C. — David J. Markey, chief of the National Telecommunications and Information Administration (NTIA), recently told a U.S. Senate subcommittee that the agency should "pay more attention to some of the actual needs and interests of communications users."

Markey said NTIA's recent efforts have been directed at international trade issues, but a study is underway to review domestic regulations governing telecommunications (CW, Feb. 18).

"We sometimes seem to have concentrated so much on trying to balance among competing corporations that we have just eight of users' interests," Markey testified. "More needs to be done in this regard, and this will be a major emphasis of our study," he added.

GAO auditors take portable laptop micros for test drive

WASHINGTON, D.C. — Auditors in the regional offices of the General Accounting Office (GAO) are field testing 16 models of portable laptop microcomputers to see which ones are suitable for use by GAO field auditors, a GAO official said recently.

The "test drive" of the laptops will continue until an internal evaluation report is issued June 14, according to Steve Jue, the project leader in the GAO's Seattle office. That report will prepare the way for bid requests, he added.

The GAO has decided to buy portables because the agency's field auditors frequently visit federal offices and need lightweight tools for data analysis, Jue said. The portable units used in the test were provided by vendors at no cost or obligation, he said.

Commerce Department plans computer price index change

WASHINGTON, D.C. — U.S. Department of Commerce statisticians plan to change the computer price index used in calculating the inflation-adjusted gross national product (GNP), so that figure will better reflect the decline in prices of computer products over the last several years, an official said last week.

Jerry Donahoe, chief of the National Income and Wealth Division at the Bureau of Economic Affairs, said the agency developed an experimental index to account for the decline of computer prices. The department has always kept its computer price index "flat," or unchanged, on the general economic assumption that price cuts mean lower quality.

The new index for computer prices will be introduced later this year as part of a comprehensive revision of the GNP calculation, Donahoe said. However, its effect on the statistic will be offset as the base year for calculating inflation-adjusted GNP is changed from 1972 to 1982, he said.

IFPS users set June meet

AUSTIN, Texas — The national meeting of the IFPS Users' Association will be held June 16-20 at the Hyatt Regency Hotel here.

The conference will focus on the themes of managing end-user computing and effective implementation of Execucom Systems Corp.'s Interactive Financial Planning System (IFPS) in a changing organizational and technical environment. Highlights include case analysis and discussion and management panels.

The keynote speaker will be Michael E. Treacy of the Center for Information Systems Research at the MIT Sloan School of Management in Cambridge, Mass.

The cost of the conference is $360 before June 9 and $460 after that date. The fee for two days is $250 before June 9 and $350 afterward.

More information is available from John Jenkins, IFPS Users' Association, c/o Southern Bell Telephone Co., 10A 55 Southern Bell Center, 675 W. Peachtree St., N.E., Atlanta, Ga. 30375.

Communications conference set

SAN DIEGO — The third annual Strategies in Telecommunications Conference will be held June 10-12 at the Hyatt Islandia Hotel here. The conference, titled "Telecommunications Planning in an Era of Uncertainty," will focus on communications issues.

Topics include predivestiture promises and postdivestiture realities, emerging network opportunities and options for users, transmission facilities, international communications, legislation and regulation.

The conference is free for clients of Gartner Group, Inc.'s Strategies in Telecommunications Service and costs $675 for nonclients. More information is available from Gartner Group, 72 Cummings Point Road, Stamford, Conn. 06902.

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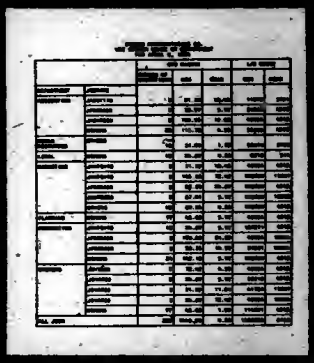

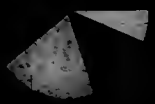

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Decision still out in Iowa DP workers' class action suit

DES MOINES, Iowa — More than two years ago, approximately 140 former DP employees of the Des Moines Blue Cross/Blue Shield of Iowa office hoped to gain redress from their former employer by filing an $18 million class action lawsuit [CW, Oct. 4, 1982]. They are still hoping.

The employees' lawsuit charges that Blue Cross/Blue Shield of Iowa wrongfully denied its employees severance pay when it hired Electronic Data Systems Federal Corp. ([EDSF] — now Electronic Data Systems Corp. [EDS]) for its DP needs in 1980. Blue Cross/Blue Shield of Iowa's DP employees were given the choice of working for EDSF, but the plaintiffs claim that they would not have received comparable benefits.

"[EDSF] didn't have the same complete Blue Cross medical coverage, and maybe the pay was comparable, but they work 10 hours a day and on weekends," said one former DP employee who requested anonymity because the matter is pending. "But the biggest thing was the lack of severance pay. We considered that an earned wage."

David Shinkle, a Des Moines attorney representing the plaintiffs, has accused Blue Cross/Blue Shield of Iowa of dragging its feet on the litigation. He cited Blue Cross/Blue Shield of Iowa's challenge to the right of five named plaintiffs to represent the former DP employees as a class. Blue Cross/Blue Shield of Iowa appealed to the Iowa Supreme Court when that challenge was denied at the district court level. The Iowa Supreme Court upheld the lower court's decision last January.

"It's been a snail's pace," Shinkle said. "Once [Blue Cross/Blue Shield of Iowa] had the chance to take the depositions of the five people who filed suit, [Blue Cross/Blue Shield of Iowa] delayed [taking the depositions] as much as possible."

Blue Cross/Blue Shield of Iowa attorney Jacki Samuelson refused to comment on the case, saying it is corporate policy not to comment on matters in litigation.

EDSF is also a named defendant in the suit. The plaintiffs claim EDSF engaged in "wholesale firings" and layoffs of former Blue Cross/Blue Shield of Iowa DP employees in the months following the conversion. "[Some employees] were told in no uncertain terms that EDSF was not the place for them," the suit said.

Blue Cross/Blue Shield of Iowa signed a 10-year contract with EDSF in September 1980, then reportedly gave its DP employees 24 hours to make a decision between working for EDSF or leaving without severance pay.

Those who remained at EDS

An EDS spokeswoman at the company's Dallas headquarters confirmed that of approximately 140 DP workers at Blue Cross/Blue Shield of Iowa at the time of the conversion, only 22 are now employed by EDS. Of those, four have relocated to EDS operations in Dallas or elsewhere, and only seven — five managers, one programmer and one systems analyst — hold senior positions in DP. The others remaining from Blue Cross/Blue Shield of Iowa's DP operation are in clerical or systems operator positions.

After the Iowa Supreme Court ruled in favor of the plaintiffs in January, Shinkle drafted a notice to inform class action members that the five named plaintiffs can legally represent them. The defendant has the right to object to the content of the notice, and the latest legal round began last month with a hearing on Blue Cross/Blue Shield of Iowa's objections. A judge's ruling on the issue is expected later this month.

For some of the employees who claim they were unfairly displaced by EDSF, it has been a tough five years. "I like my new job, but at this point I'm probably $6,000 to $8,000 below what I would have been if things had stayed the same," said one former worker who managed to find another DP job in the Des Moines area. "I'll probably never catch up, and it takes a while to learn to live on less income."

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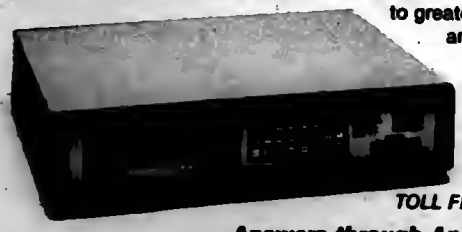

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Prime exec moves to AT&T

MORRISTOWN, N.J. — AT&T last week said it has named former Prime Computer, Inc. Vice-President Roland Pampel to a new vice-presidential position in its Computer Systems unit.

While expressing regret about the departure of Pampel, Prime President and Chief Executive Officer Joe M. Henson declared that the AT&T appointment was "a great credit to Roland and to Prime."

AT&T said Pampel will direct software development, marketing and sales for the Computer Systems unit. Prior to joining Prime, Pampel was employed at IBM, where he was involved in the development of minicomputers and Systems Network Architecture (SNA). James D. Edwards, president of AT&T's Computer Systems organization, said Pampel's "knowledge of SNA and distributed data processing are valuable assets."

RESOURCE from page 1

More important, they say, an HRMS can transform the personnel department from a service center to a vital force within a company. In addition to supplying complex work-force-related information to be used by upper management in strategic planning, the HRMS can monitor and modulate personnel performance to assure maximum return on that investment.

"Our personnel application was mainly a payroll system expanded to hold personnel information," Marine Midland's Flannery said. "It was vintage 1960s technology and just too restrictive. We realized that we needed a system flexible enough to allow us to get management information quickly, in an on-line fashion."

Absolute necessity for today and future

Like Marine Midland, many companies are finding that the information and insights a modern HRMS can provide are vital assets in an increasingly competitive economy. "Human resource management information is an absolute necessity for today and the future," Flannery said.

"The driving force behind human resource systems today is not simply the desire to automate the personnel function but to ensure that personnel plans fit the strategic plan of the company," said Ronald Pilenzo, president and chief operating officer of the American Society for Personnel Administration (ASPA).

As head of ASPA, Pilenzo oversees the world's largest association of personnel professionals. ASPA's 34,000 worldwide members represent some 40 million workers, he said.

> ***An HRMS can transform the personnel department from a service center to a vital force within a company.***

"Companies are gaining an awareness that utilizing people data is an essential management tool," he said.

Pilenzo's comments were echoed by International Data Corp. (IDC), a Framingham, Mass.-based market research firm, in a recent study of the applications software marketplace.

"Access to computing power is a reality for more and more users in the large business environment and is fueling new applications growth. . . . Small businesses, too, are more and more able to afford to invest in the productivity gains yielded by computerization. These are among the major reasons for the growth forecast of . . . horizontal markets such as accounting and human resources," the study stated.

"Human resources, particularly, has undergone a dramatic change in the past 10 years," IDC concluded.

"Managing human resources has become more and more critical in the intense, competitive environment of a society in transition from an industrial to an information economy."

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Why key DP/MIS managers are keeping RCA Cylix a secret.

SELECTED LARGE-SCALE ON-LINE* HUMAN RESOURCE MANAGEMENT SYSTEMS

Argonaut Information Systems, Inc.	AIS Human Resources System	IBM mainframes (OS, DOS); Digital Equipment Corp. VAX (VMS); Hewlett-Packard Co. HP 3000 (MPE)	Employee biographical data, position control, performance and salary review; applicant processing; personnel regulations; salary administration, benefits management; government compliance and Occupational Safety and Health Administration (Osha) reporting	AIS Payroll IV	HP Image 3000	No	No	Yes
Dalton Systems, Inc.	CS/Personnel	DEC VAX (VMS); HP 3000 (MPE)	Applicant tracking; employee history; [illegible] and attendance tracking; benefits tracking; positions control; standard and general personnel reporting; skills inventory; miscellaneous employee data storage	[illegible]	HP Image 3000	[illegible]	[illegible]	[illegible]
Cornshare, Inc.	Profiles Applications Library	Available through Cornshare's time-sharing network	Human resource planning; salary administration; Equal Employment Opportunity/Affirmative Action (EEO/AA) planning; general personnel administration (service offers statistical/analytical reports)	Optional (Cornshare's Quester DBMS)	May be used with Quester via time-sharing	Yes	Optional (provided through Quester)	Yes
Computer Associates International, Inc.	CA-Personnel Management	Data General Corp. MV/Eclipse (AOS, AOS/VS)	Skills [illegible] employee [illegible] benefits [illegible] payroll processing; government [illegible] reporting	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cortex Corp.	Cortex Human Resource Management System	DEC VAX (VMS)	Personnel administration; applicant/job placement; government compliance reporting; benefits/pension administration; statistical analysis subsystem	Not integrated	Product includes data management system	Yes	Yes	No
Cullinet Software, Inc.	Human Resources System (HRMS); Human Resources System/Personnel	IBM mainframes (OS, DOS, MVS)	Payroll processing; benefits administration; personnel and recruiting; benefits administration; government compliance reporting; job evaluation processing; training data base	Limited	Cullinet IDMS/R	Yes; Optional through IDMS/R	Yes; Optional through IDMS/R	Yes
Cyborg Systems, Inc.	On-Line Payroll/ Human Resource	Any processor that supports Ansi Cobol	Payroll processing; benefits management; position control; applicant tracking; time and attendance monitoring; manpower planning; employee/labor relations; health and safety monitoring; EEO/AA planning	Not integrated	IBM IMS; Cullinet IDMS/R	Yes	Yes	Yes
Dayton Software Systems, Inc.	Dayton Human Resource Management System	IBM mainframes (OS, DOS)	Payroll processing; personnel management	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

AIS Human Resources System	Yes	Yes	No	No	Access restricted by menu, option, function, terminal, user, organization; optional violation logging	All tables and certain fields may be user-defined; modular design allows each organization to tailor system	$10,500 to $36,000
CS/Personnel	Yes	Yes	No	Statistics only	[illegible]	[illegible]	[illegible]
Profiles Applications Library	No	Yes	Profiles/PC runs on IBM Personal Computer XT; allows for data sharing with Profiles Applications Library	Yes	Security at password, account, location, user, group levels	Provides advanced analytical reports and modeling capabilities; time-sharing network supports multiposition organizations	Based on use; e.g., an average report costs $15 to $220, based on number of employees
CA-Personnel Management	Yes	Yes	No	No	[illegible]	[illegible]	[illegible]
Cortex Human Resource Management System	Yes	Yes	Version runs on DEC Microvax	Yes	User-defined security extends to fields within modules; provides two levels of password protection	User may tailor system tables via prompts; reporting tools allow data to be viewed in a variety of formats	$40,000
Human Resources System/Payroll; Human Resources System/Personnel	No	Yes	[illegible] accessed from other through Cullinet Interactive Facilities; also [illegible]	No	[illegible]	[illegible]	[illegible]
On-Line Payroll/ Human Resource	Yes	Yes	Version runs on Personal Computer XT	Statistical only	On-line security system controls access by application, function, screen, employee, group, field	Provides complete federal 401(K) regulation compliance; facilitates on-line pay calculation for manual checks	$45,000 to $140,000
Dayton Human Resource Management System	Yes	Yes	No	Yes	[illegible]	[illegible]	[illegible]

The products included in these charts were selected on the basis of available market research and interviews with industry consultants and researchers. The list is intended to represent a sampling of the human resource management systems available for large processors. It is not intended to be an exhaustive summary of available products.
* All products were described as fully on-line systems by their vendors.

[illegible] Science, Inc.	Human Resource Software	IBM mainframes (all standard operating systems); Wang Laboratories, Inc. VS (VS)	Personnel management; EEO reporting; applicant tracking; benefit statement production; payroll processing; health claims processing; position administration; flexible compensation and defined contribution administration; position control	Not integrated	IBM SAS, DL/1; Software AG Systems, Inc. Adabas	Yes	Yes	Yes
Management Science America, Inc.	MSA Payroll/Personnel System	IBM mainframes (OS, DOS/VSE, MVS); Honeywell, Inc. DPS 8 (Sixty); Sperry Corp. 1100; NCR Corp. V/IX; Burroughs Corp. large- and medium-scale systems	Payroll processing; personnel management; compensation and salary administration; career planning pools inventory; progression planning; benefits administration; employee/labor relations; Occupational Safety and Health Administration compliance; position control; time and attendance reporting; [illegible]	General Ledger, Forecasting and Modeling System	IBM SAS, DL/1; Cullinet IDMS; Software AG Adabas; ADR Datacom/DB	Yes	No	Yes
Software International Corp.	Human Resource Management System	IBM mainframes (OS, DOS)	Payroll processing; personnel management; applicant tracking; position control; report writer; Canadian version	General Ledger Cullinet IDMS	IBM Vsam, DL/1, SAS;	Yes	No	Yes
[illegible] Corp.	Personnel Management System; Benefits Risk Administration; Payroll Processing; Claims Processing	IBM mainframes (OS, DOS, MVS)	Employee record keeping, training and development; government compliance reporting; employee relations (communications); placement; position control; labor relations; benefits/fund/risk management; time and attendance reporting; labor distribution	Not integrated	IBM SAS, Vsam; Software AG Adabas; Cullinet IDMS	No	No	Yes

ISI Human Resource System	Yes	Yes	Data can be transferred to Criterion micro applications through user link	Yes	On-line security system controls access by password, module, terminal, organization, access or any combination	Checkwrite feature produces on-line payroll checks; tip processing feature allows for tip (gratuity) income accounting	Mainframe, $125,000 to $250,000 System/38, $35,000/module
HRIM Payroll HRIM Personnel	Yes	Yes	Interactive PC Link provides for data transfer to micro applications	No	Security limits range from organizational/company level down to data element level	Federal 401(K) discrimination testing capabilities; Bordereau Query provides information across across MAD products	$95,000 to $300,000
Human Resource Information System	Yes	Yes	No	No	Application-security by such items as department, user, transaction, function, password	Date-sensitive modification feature automatically changes data base records at specified date; tables architecture allows users to table system without coding	$60,000 to $125,000

The products included in these charts were selected on the basis of available market research and interviews with industry consultants and researchers. The list is intended to represent a sampling of the human resource management systems available for large processors. It is not intended to be an exhaustive summary of available products.
* All products were described as fully on-line systems by their vendors.

HRMS buyers urged to fit system to company needs

PRODUCT SPOTLIGHT

What should a potential buyer or developer look for in a large systems human resource management system (HRMS)?

Beyond core features — including a comprehensive personnel data base, ad hoc data access tools, a flexible architecture and integration with payroll (see story page 1) — HRMS analysts said buyers should pick and choose according to their needs from among the wide variety of available functions. The system selected should be flexible enough to accommodate their changing needs.

"The bottom line, from both a cost and efficiency standpoint, is what the data tells you," said Ronald Pilenzo, president and chief operating officer for the American Society for Personnel Administration. "If you cannot answer that question, do not buy the function. You run the risk of getting a system that gives you a lot of nice-to-know rather than need-to-know information.

"You also have to look 10 years out and plan for the data you will need then," he added. "Does the data the HRMS gathers and maintains fit in with the organization's strategic plan?"

Because so much employee data is shared between personnel and payroll — functions that are often handled by different departments within a company — the integration of the two systems is generally considered a necessity.

"What you want is a system that integrates payroll data but is not driven by it," Pilenzo said. "That linkage between payroll and personnel is critical. Some companies have two separate systems, and that can create monumental problems in exchanging data, including long lag times and lost information."

The importance of the payroll/personnel link is not lost on Betty Jo Baker, personnel manager for *The Baton Rouge State Times & Morning Advocate* in Louisiana. Before the newspaper, which employs some 720 workers, purchased a personnel system that could be integrated with the existing payroll system, Baker's staff had to submit all types of employee information manually to the payroll department for inclusion in the payroll system.

According to Baker, that meant a lot of paperwork and a lot of missing or delayed information. She characterized the integrated payroll/personnel system running on the newspaper's Digital Equipment Corp. VAX processor as a godsend that has saved her department a great deal of time.

Personnel-specific data base

Another important characteristic of a sophisticated HRMS is a comprehensive personnel-specific data base that is handled either by the system's data base management system — something relatively few HRMS vendors offer — or through interfaces to one or more widely installed DBMS.

"The system clearly should have a comprehensive data base that is segmented so various users can get control of their respective piece," said Vincent Ceriello, president of Los Altos, Calif.-based VBC Consulting Group, Inc. "With the need to access information quickly and easily, a relational DBMS-based system is especially useful here."

In addition, if the HRMS is to be anything more than simply a storage mechanism or a static reporting tool, it should offer some means for accessing data quickly on an ad hoc basis, either through a flexible report writer or through a query language.

Ceriello also highlighted the importance of data access tools. "Reports used to be just lists," he said, "but now users are looking for [decision support system-type] reports — fourth-generation language-generated or ad hoc reports to aid in planning. The HRMS should offer a complete set of reports, both standard and query driven."

But above all, analysts and users emphasized, the system must be flexible enough to handle both those changes forced on the company by the outside world and the growth and change specific to the company. That flexibility should be embodied in the basic HRMS software architecture that, in the case of many vendors' products, is based on a system of user-definable data tables.

Both users and analysts agreed that the decision to buy a particular HRMS should rest with the end users — the personnel department — based on the guidance, not the dominance, of DP.

"Personnel needs advice and consent from DP," Ceriello said. "Is the HRMS practical? Will it work in our environment? What is our policy on micros? What related software can we support? Those are the kinds of questions DP can answer.

"But the decision of which package to buy should rest primarily with personnel," he continued. "A system imposed on personnel will not fly, even if it is a technical masterpiece. Personnel should say to DP, 'don't tell me what to do, and I won't tell you how to do it.' "

— John Gallant

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As Michael Lilly says, the company's decision to stake its future in MIS on Digital's VAX computers – and the office automation tools like All-In-1,™ DECnet™ and DECmail™ software that run on them – was hardly a snap judgment.

Every major computer company was considered. Lilly says that, "dollar for dollar," only Digital's VAX system offered the power, ease of use and communications capability with other computer systems – including IBM – that AMF needed.

So AMF chose the VAX computer – the best-selling 32-bit computer in the world – and waited to see what the machine could do.

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Lilly and his group didn't have to wait long. The system was up and running within days.

Reaction within the department was rapid and gratifying. "We really got excited about it," says Lilly. "Immediately, we were communicating better." And there was more – spreadsheets and word processing and a mail system. "Suddenly," Lilly said, "we had a vehicle for total open communications to every important person or department in the corporation."

Part of the story behind AMF's almost instantaneous rapport with the VAX system is that it's so easy to use. Menus and operating commands are the same for each fully integrated application. Whole functions are completed in as few as two keystrokes. And because everything is in plain English, it's literally as simple as A-B-C to incorporate.

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VMS software development tools have so improved the way things are done in his department, Lilly says, that he projects the savings in applications development time and costs alone at some 70 percent.

"Many of our new applications here at AMF will be written on that machine. I can't quantify it exactly. All I know is that I'm getting a heck of a lot more bang for my buck."

The first tests of VAX equipment proved so successful, that AMF quickly enlarged the system, adding terminals and DECmate™ and Rainbow™ personal computers. New departments went on line, for example finance..

"And that," says Lilly, "really created an explosion." Now AMF is implementing programs like general ledger systems, stock options and inventory systems, and keeping more efficient and flexible records, from accounts payable to personnel.

Adds Lilly, "People here are screaming to be on the VAX system, and there's got to be a reason for that. And I tend to think that it's return on investment, mailing lists, discounted cash flows, spreadsheets they couldn't even begin to do before, versatility, tremendous graphics potential. It's just a whole world of opportunity that is elevating AMF to the forefront."

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Lilly feels the VAX system has already elevated his own department to the forefront.

"It's put corporate MIS on the map," he says. "It has effectively increased productivity and efficiency. People are beginning to believe we can do the things we say we are going to do."

And what VAX technology is doing for his group, Lilly believes, it can do for all of AMF, or indeed for any company. "Any corporation that employs this technology," he says, "is going to get the competitive edge.

"This technology will explode. Because there are a thousand reasons to have it. But what it really all boils down to is this: everybody will want a VAX system because they can do the job better, faster and more efficiently.

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HRMS holds money-saving potential for growing firms

PRODUCT SPOTLIGHT

Although automating formerly manual personnel tasks may not be the primary catalyst sparking increased human resource management system (HRMS) usage today, the move to reduce paperwork and speed employee information processing has been an important factor in that growth.

Damian Rinaldi, director of International Data Corp.'s (IDC) Software and Services Information Program, explained, "The costs associated with managing people have risen dramatically. In large organizations, users can achieve significant savings if the management of human resources is more efficient."

Naomi Lee Bloom, senior principal with the Arlington, Va.-based management consulting firm American Management Systems, Inc., outlined a few of the ways an HRMS can help a company pare costs.

"Companies spend a bloody fortune on recruiting," she said. "It is both difficult and expensive. If you have good position-control and career planning capabilities and can identify appropriate in-house candidates, you can save a lot of money by promoting from within. "Also, in the area of union relations, the most important thing is prompt response to grievances. If you have a tracking system so that nothing about a grievance slips through the cracks, you can contain the costs related to them. That is also true with safety-related incidents."

Record requirements changed

The increasing burden of federal and state directives — such as the Equal Employment Opportunity Commission and Affirmative Action legislation and Occupational Safety and Health Administration guidelines — requiring companies to maintain detailed records and to report regularly on compliance has also been a factor in the spread of HRMS. But that, most observers agreed, has changed somewhat under the administration of President Ronald Reagan.

"Government compliance reporting is not as important a force as it once was," said Vincent Ceriello, president of Los Altos, Calif.-based VEC Consulting Group, Inc. Before founding VEC Consulting, Ceriello worked in personnel systems development at Ford Motor Co., where he helped develop a company-wide skills inventory system. He also specialized in custom HRMS development at Information Science, Inc., a vendor of human resource software, and was head of manpower planning for San Francisco-based Bank of America.

"That is a function of the current administration and of the backlog of cases awaiting action at the various watchdog agencies," Ceriello continued. "It is just not as big a concern to companies and not as big a factor in the push to HRMS. Today, cost containment, benefits and salary management and comprehensive personnel planning are much more important forces."

Nonetheless, only the smallest companies can still handle that type of detailed record keeping and compliance reporting manually. In addition, some recent developments in the field of personnel management have also spurred wider interest in HRMS.

"Compliance reporting initially caused people to look for systems that could automate that function," said Douglas Phillips, manager of professional services for Andover, Mass.-based Software International Corp.'s HRMS product. "More recently, people have turned to these systems for help in managing programs like 401(K) and cafeteria-style benefits."

Also, according to Bloom, interest in multifunction human resource systems has

See HRMS page 34

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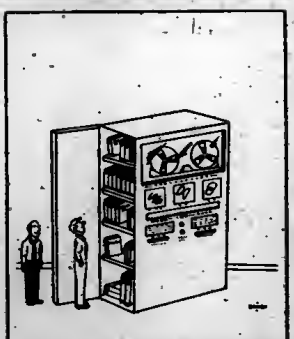

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Allowing time to fine-tune system pays off for bank

PRODUCT SPOTLIGHT

The exhaustive product evaluation process was complete. Marine Midland Banks, Inc. had finally selected a human resource management system (HRMS).

The Integral Systems, Inc. ISI Human Resource System purchased to run under Cullinet Software, Inc.'s IDMS data base management system on the bank's IBM mainframe was intended to replace an aging, inflexible system that had been developed in-house. A year and a half before the ISI HRMS package was to go on-line, Marine Midland brought the system in-house and began a lengthy modification project.

Was this an incongruous approach to an HRMS implementation?

Not at all, according to William Flannery, administrative vice-president and director of human resources operations and planning for the Buffalo, N.Y.-based bank.

"We had questioned our top executives about their information needs into the coming decade," Flannery said. "Their responses highlighted certain things we felt the [package's] data base had to accommodate, certain vital fields that had to be included. So we enlarged the data base to extend the usefulness of the package beyond its normal life span."

In modifying an already large system, Flannery admitted that Marine Midland was "going down some untraveled roads." For example, modifying the personnel data base forced Flannery's staff to alter the product's report writer. Flannery also said the modifications were expensive.

Thus, he advised potential HRMS users to forego alterations to avoid unexpected difficulties and problems with new releases.

Some would argue that in the amount of time Marine Midland allocated to modifications, the bank could have developed its own HRMS. But Flannery disagreed. "In-house development is not a viable option today," he said. "It is simply too costly and too time consuming."

What is Flannery's advice to prospective HRMS users? "Be certain you clearly specify what you need in a system and understand specifically what the vendor has to offer."

Betty Jo Baker, personnel manager for *The Baton Rouge State Times & Morning Advocate* in Louisiana, also has some advice for people contemplating the purchase of an HRMS. "Make sure it is interfaced to payroll. That has been a godsend for us," Baker said. The newspaper uses Collier-Jackson, Inc.'s CJ/Personnel system running on its Digital Equipment Corp. VAX-11/780 processor.

Because the HRMS is linked to the CJ/Payroll package on the VAX, Baker said, information flow between the paper's personnel and payroll departments has improved. Lost and delayed paperwork is no longer a problem. The HRMS has also eased the staff's regulation compliance reporting work load and has allowed Baker to set up an applicant tracking system to manage information on the approximately 2,500 people who apply for employment each year.

"We even set up a hot list of more qualified applicants that the system generates based on, say, the levels of education or experience we request," Baker said. "We can just call up the list instead of wading through [the list of] all those other applicants."

— John Gallant

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NEWS

Speaker says bias colors criticism of federal DP shops

By Elliot Sutta
CW Washington Bureau

WASHINGTON, D.C. — Computer managers in the U.S. government have been unfairly criticized for years by outsiders who failed to understand the unique characteristics of federal DP systems.

That was the opinion of Robert V. Head, a 13-year veteran of government DP management and keynote speaker at the 11th Annual Federal DP Expo & Conference held here recently.

Head said recent studies critical of federal DP management were conducted by outside experts and thus contained a built-in bias that the government should operate its information systems as private industry does.

The speaker noted four reasons why government data systems are unique:

■ The federal government's $15 billion DP operations are much larger than those of private firms.

■ With size comes complexity — more subsystems to design, more lines of code to write and more interfaces to specify.

■ Federal information processing is conducted in a goldfish-bowl atmosphere in which expenditures and blunders get publicity.

■ Laws and regulations make managing federal systems more difficult than managing systems in the private sector.

Head gave the keynote speech shortly before his scheduled retirement from government service. He is currently an assistant to the commander of the Federal Computer Performance Evaluation and Simulation Center, a technical services organization that supports computer planning for military and civil agencies.

To garner more respect for the government computing community, Head urged federal DP professionals to take a more active role in improving their public image.

He also recommended that agencies respond to increases in end-user computing by setting standards for hardware and software compatibility and by abandoning the 20-year-old policy of centralized supervision of DP.

HRMS from page 20

only sprung up relatively recently because the technology driving the functionality of such systems has only been perfected in the past 10 years.

More sophistication

"Payroll was straightforward and easy to automate," Bloom said. "But personnel is . . . tough to automate. It does not boil down to algorithms. That is why the early human resource systems were only simple record keepers, just data fields added to payroll. Today, HRMS is much more sophisticated and includes decision support, modeling and analytical capabilities. These technologies themselves are relatively new."

Whatever the forces behind its growth, observers such as Phillips and Blaisdell agreed that the market for human resource software is expanding rapidly. IDC estimated that in 1984 independent software vendors earned some $305 million from the sale of such systems. That figure represented an almost 45% increase over sales in 1983.

This year, according to IDC, the independents will garner approximately $440 million from the sale of HRMS, a 43% jump over 1984 figures. IDC's estimate for 1989 puts that sales figure at roughly $1.75 billion.

— John Gallant

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NEWS

INTERNATIONAL REPORT
CW International News Network

DENMARK

COPENHAGEN — Datateam, a two-year-old Danish wholesaler, has acquired its Swedish competitor, Ovell Plus, for an undisclosed amount of money, according to a company source.

The union of the dealers' assets strengthens Datateam's position in the personal computer and add-on markets, a spokesman said. Datateam now has subsidiaries in Norway, Sweden and Finland.

■

COPENHAGEN — Nixdorf Computer AG will terminate its cooperative agreement with Logatron, its Danish agent, at the end of 1987. Since 1976, Logatron has represented Nixdorf throughout Scandinavia, but within the past few years, the firm lost its contract to sell the Nixdorf product line in Norway and Sweden. Sales of Nixdorf's products in Denmark will now be handled by a Nixdorf subsidiary.

ENGLAND

LONDON — Lloyd's Bank International has begun implementing a worldwide network linking operations in 47 countries with Sopho-Net from Philips Telecommunications B.V., the Dutch communications giant.

The Sopho-Net system will handle data, text, foreign exchange conversion, letters of credit, interbank information and electronic mail traffic over five nodes located in London, Tokyo, Hong Kong, Paris and Madrid. Another 32 nodes are in the process of being installed, according to a spokesman.

Some 20 different bank applications running on equipment from IBM, Digital Equipment Corp., Wang Laboratories, Inc., Perkin Elmer Corp. and General Automation, Inc. will reportedly be linked by Sopho-Net.

■

LONDON — British computer maker Systime has given new meaning to the phrase "catch-22." Facing a $600,000 fine imposed by U.S. authorities for shipping Digital Equipment Corp. PDP-11 minicomputers to Pakistan and Iraq in 1981 without appropriate U.S. re-export licenses, the company has now been told it will be fined by the European Parliament for breach of European Economic Commission trade regulations if it pays the U.S. fine.

SWEDEN

STOCKHOLM — Unsatisfied with the fruits of its recent research, the Swedish government is continuing to probe the possible connection between birth defects and VDT-related work, according to Anna Greta Leijon, a government minister.

"To date, we have no sufficient proof showing a direct correlation between birth defects and [VDT-related work], but at the same time it is not absolutely clear that there is no risk either," Leijon said.

She will consult with representatives of labor and management to see if it is possible to allow pregnant VDT workers to be fill other positions during their pregnancies. "If we can't arrange it through negotiations, we will have to consider legislation," Leijon stated. She added that manufacturers should increase efforts to find alternatives to VDTs.

■

STOCKHOLM — Management Science America, Inc. (MSA) has opened a subsidiary here, which will be responsible for MSA product sales and support throughout Scandinavia. "We are counting on quickly gaining a large market share," said Mats Bofors, president of MSA in Sweden. Last year, before establishing the Swedish office, the company sold $900,000 worth of software in Sweden through its British office. "We expect [sales of] $2.5 million for 1985," he added.

WEST GERMANY

MUNICH — German plug-compatible manufacturer BASF plans to bring its upgraded top-end mainframe to the market at least six months ahead of IBM's 3090 series, sources reported. BASF's 7/90-2 and 7/90-4 models, built by Hitachi Ltd., will be available during the second quarter of 1986, while IBM's fastest machine, the 3090 Model 400, is not expected to appear until mid-1987.

In performance, the BASF 7/90-2 corresponds with IBM's Model 200, and the 7/90-4 is comparable to the IBM Model 400.

Dexpo West '85 set for Dec. 11

PRINCETON, JUNCTION, N.J. — The eighth national exhibition of equipment for Digital Equipment Corp. systems will be held Dec. 11-13 at the Anaheim Convention Center in Anaheim, Calif.

Dexpo West '85 will feature exhibitors of software, hardware, systems and services that are compatible with the DEC line of computers.

Cost of admission to the show is $5.

More information is available from Expoconsul International, Inc., Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

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The words above are taken from a 35-page white paper written by Software International, the company whose first general ledger package actually started the applications software industry 15 years ago.

Entitled, "Setting Standards In Mainframe Applications Software," the report may be the first of its kind—the first ever to set down on paper the standards appropriate for application software products.

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ROSEMEAD, Calif. — An electric utility company here is using business applications ranging from managing a nuclear power facility to improving customer service and meter-reading processing.

Southern California Edison (SCE) is one of the nation's largest public utilities, providing electricity to approximately 3.5 million residential, commercial and industrial customers in 800 Central and Southern California cities and towns.

An IBM customer since 1973, SCE runs most of its business applications on two IBM 3084s and an IBM 3081 processor, known as the computer complex because information can be transferred among them, according to John R. Fielder, manager of the computing services division. It supports 128 IBM direct-access storage devices, 4,000 IBM 3270 on-line terminals, four IBM 3800 printing subsystems and numerous other peripheral devices.

SCE was one of the first companies to install IBM's MVS/XA operating system. This software architecture is said to enhance the 3084s, allowing SCE to obtain more storage capacity with a minimum of system changes.

Three major DP needs

"Our IBM configuration [3084 Model Qs running MVS/XA] helps us respond to three major data processing needs within SCE," Fielder said. "First, it accommodates a large portfolio of batch and on-line business applications. Second, it handles our growing office/information center operations. And third, it enables the development of new and critical applications."

A 3081 Model K was upgraded to a 3084 Model Q in one day in April 1983. About a year later, a second 3084 Model Q was installed also in one day, according to Fielder.

One 3084 Model Q processes approximately 600,000 transactions and makes daily inquiries through the company's Customer Information System, an application developed by SCE. About half are customer inquiries that go to field and service representatives, who receive the information through on-line terminals, Fielder said.

"Our customer service department handles all kinds of transactions and interactions," Fielder explained. "When a customer establishes credit, or someone requests that service be turned on or off, a transaction occurs, and a record is generated in the IBM system."

The system produces an average of 185,000 bills each working day. These are printed by four 3800 laser-based printing subsystems.

Another SCE-developed application is a Material Management System that coordinates supplies necessary for the construction and maintenance of electrical facilities and equipment. Subfunctions include acquisition analysis, assembly maintenance and physical inventory.

Management information about SCE's San Onofre Nuclear Generating Station near San Clemente, Calif., is also maintained by the system. Information about plant maintenance, administration, safety and staff training is available, Fielder said.

The other 3084 Model Q supports an information center — a facility that provides help for professional and clerical staff. "With terminals and IBM Personal Computers, the staff can generate graphics, handle simple data base applications, develop models and perform spreadsheet functions," Fielder said.

"Our office systems group is directing text processing applications to an IBM configuration to take advantage of extended functions available through the mainframe connection," Fielder noted.

Twenty IBM 5520 administrative systems support between 200 and 300 users. Approximately 50 3270 Personal Computers and several IBM Displaywriters tie into the central network, or will soon, using IBM's Distributed Office Support System as the host software, Fielder said.

Roughly 360 applications programmers who develop programs and maintain existing ones use the 3081.

The 3084s are also at the heart of a system to improve the processing of meter readings, Fielder said.

Currently, the utility's 545 meter readers read an average of 380 meters daily and log the data on special forms scanned by optical character readers. Soon, they will enter meter readings on special devices that resemble hand-held calculators. The data will be recorded on microcassettes inside the devices.

At day's end, information on the microcassettes will be sent by telephone lines to five IBM Series/1 computers, which will pass it on to a 3084 for billing purposes.

The program is expected to be fully operational by early next year.

"This will increase the accuracy of the readings and improve our service to customers, as well as reduce the paperwork for the meter readers," Fielder said.

SCE recently installed an IBM performance improvement option on the 3084 Model Qs to increase internal execution speed by about 6%.

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LOW TECH FOCUS
George Morrow
on silicon chips

CHARGED BODIES
By Thomas Mahon

Here's another book for mainframe types who make their living far from the "People, power and paradox in [the] Silicon Valley," mentioned in this book's subtitle.

This work is more biography than it is history — the microcomputer takes a back seat to the people who invented it and marketed various parts of it.

The author labors to sell the glamour and importance of the valley. Here is, he said, "perhaps the most far-reaching inquiry into the nature of intelligence. Combined with research in bioengineering and artificially intelligent software, this inquiry may extend dramatically our sense of who we are and what we can do, and affect our very evolution ... A thought breakthrough waits ahead of us, in comprehending who we are and how to proceed from here. It may come from a supercomputer, from a radio signal sent up an advanced civilization or from another tormented, inspired loner." Wherever this idea is germinated, it will owe a debt to the community of Silicon Valley, Thomas Mahon said.

He likes to create myths, for instance, about the swift, all-powerful venture capitalists: "Their communications network is reputed to be instantaneous. And lethal if used be. The entrepreneur who is discovered trying to put something over on his backer or prospective backer — withholding some element of risk, or overstating the product's capabilities, for example — will not only find those negotiations terminated, but discover that the resulting bad rap will likely extinguish the chances of future deals anywhere else as well."

Another example: "The relationship of the founder to his or her business/social entity is as complex and as deeply felt as the love-hate relationship Michelangelo had for the Sistine Chapel ceiling."

A reader with a high tolerance for such hyperbole can find interesting stories here: Robert Noyce, commenting on the simultaneous discovery of the integrated circuit in two places, says that it was an idea whose time had come. If he or Jack Kilby had not made the discovery, somebody else would have within a year or two.

Alan Shugart, who moved on to defend Seagate Technology, Inc., reflects on competing against the company that still bears his name: "It used to bother me in the early days when I would hear people complaining about [Shugart Corp.]. Now I see it in the paper all the time, and it doesn't bother me. [People] don't even recognize it as my name, I guess."

The author describes the evolution of George Morrow's company from Morrow's Micro Stuff to Thinker Toys, Inc. to Morrow Designs, Inc. There is also an interesting section on Stanford University's evolution into "The Harvard of the West." And Mahon relates reactions of friends who come up from Los Angeles to the valley. They often ask, "How can you stand it? It feels as if it's going to implode!"

When he finds a dissenting voice to life in the fast track here, the author nimbly removes the place Paradox Valley, suddenly so complicated that no "Baedeker, no Virgil" (did he really write this?) could presume to be the single guide.

Hardcover, 320 pages, $16.95, ISBN 0-453-00457-3. New American Library, 1633 Broadway, New York, N.Y. 10019.

THE REGIS TOUCH
By Regis McKenna

The image makers typically stand behind the images they create. Not so for Regis McKenna, whose face and thoughts regularly appear in national magazines.

He is often, literally, the story who steps out from behind the story.

Now, this consummate public relations man — or marketing consultant, as the book jacket describes him — has taken up the pen to tell others how he helps companies pitch themselves. His suggestions include the following:

■ Building strategic relationships with suppliers, distributors and customers is more important than "low prices, flashy promotions or even advanced technology."

■ Advertising to the masses is less important than reaching the 10% — the retailers, analysts, journalists and "luminaries" — of any industry that influences the other 90%. (IBM failed here with the PCjr.)

■ "When a company is able to develop the infrastructure fully, it is almost impossible for its product to fail." (Lotus Development Corp. succeeded here with 1-2-3.)

■ "Whichever company mobilizes its product most quickly and most effectively will win the product-positioning battle."

McKenna grew up professionally with Silicon Valley. He suggested that high-tech

Money should be spent creating a
See Regis, page 42

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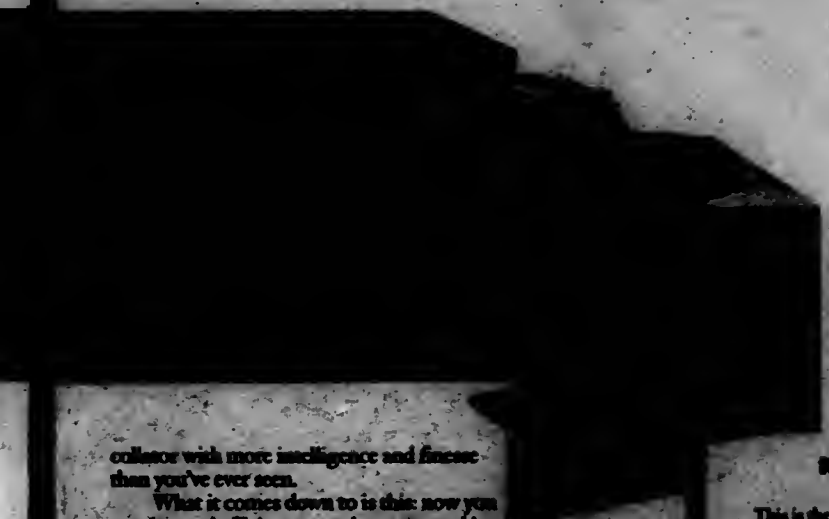

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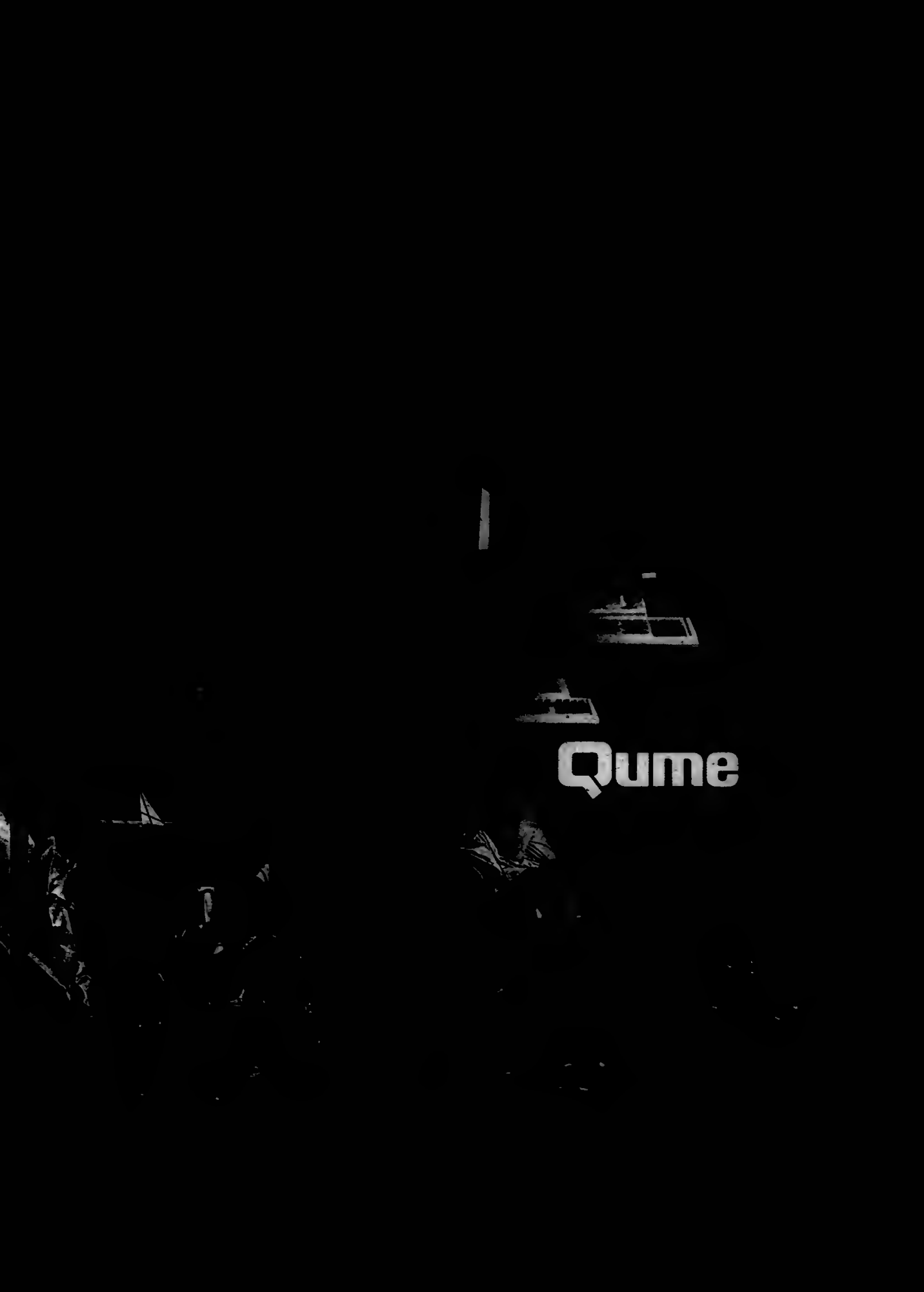
Qume

BOOKS from page 39

lasting image, not a fleeting message. The marketing-driven approach, he said, relies on advertising and promotion; the market-driven approach emphasizes strong products, understanding the customer and building relationships.

McKenna is a quotable marketing man. He wrote: "Customers are always enthusiastic about future products, but they don't necessarily buy the products once they are introduced. In many cases, there seems to be an infinite demand for the unavailable." About market projections, he said: "You can choose any numbers you want and reach any conclusions you want."

Much of the book is general advice and as such is fine to read but difficult for a company to apply.

Readers get an interesting view here of what companies in an increasingly competitive and unforgiving market are doing to sell themselves. The book presents an unintended message to users: Sort out what products and companies actually offer from what they seem to offer. Take back the control the vendors and the image makers exercise over the variables in making purchase decisions.

Hardcover, 179 pages, $15.95, ISBN 0-201-13981-2. Addison-Wesley Publishing Co., Reading, Mass. 01867.

OUT OF THE INNER CIRCLE

By Bill Landreth
with Howard Rheingold

To a hacker, perfection is breaking into a system and using it undetected.

So said Bill Landreth, alias "The Cracker," a 19-year-old hacker wizard arrested in 1983 for tapping into the GTE Corp. Telemail network. Landreth was a member of the "Inner Circle," a band of hackers, approximately 10 of whom had their personal computers, modems and even telephones confiscated by the FBI.

Landreth pleaded guilty and was sentenced to three years probation and ordered to pay GTE $87 for unpaid telephone charges. Now The Cracker is in print with a hacker's guide to computer security.

Out of the Inner Circle tells who hacks and why, as well as how they do it. The book points out the weak links in security and the devices used to correct the problems.

"User friendly," Landreth said, is often synonymous with "hacker-vulnerable." Machines running AT&T's Unix and Digital Equipment Corp.'s Tops, RSTS and VMS operating systems are favorite targets.

Early versions of Prime Computer, Inc.'s Primos did not require passwords for logon, although Primos is now among the most secure of operating systems, Landreth writes.

"The hackers' world as a whole does not contact IBM systems nearly as much as it contacts other systems," Landreth said.

The Cracker's chief advice for combating hackers is to educate users, whom he calls the "weakest link in the security chain. When a hacker is discovered, Landreth recommended that the system operator enlist the hacker's aid before neutralizing him.

Paperback, 230 pages, $9.95, ISBN 0-14-087-139-X. Microsoft Press, 10700 Northup Way, Box 97200, Bellevue, Wash. 98009.

— John Desmond

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BOOKS OF NOTE

THE COMPLETE IBM PERSONAL COMPUTER, a guide to hardware for expanding the Personal Computer, Personal Computer XT, AT and compatibles, by Seth Novogrodsky, Frederic Davis and the editors of *PC World* magazine. Paperback, 281 pages, $16.95, ISBN 0-671-49278-0. Simon & Schuster, Inc., Rockefeller Center, 1230 Ave. of the Americas, New York, N.Y. 10020.

ARTIFICIAL INTELLIGENCE & ROBOTICS: FIVE OVERVIEWS, examines AI technology and reviews the state of the art. Hardcover, 618 pages, $99.50, ISBN 0-89934-227-2. Business/Technology Books, 14 Evergreen Drive, Orinda, Calif. 94563.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harvey, Book Review Editor, Computerworld, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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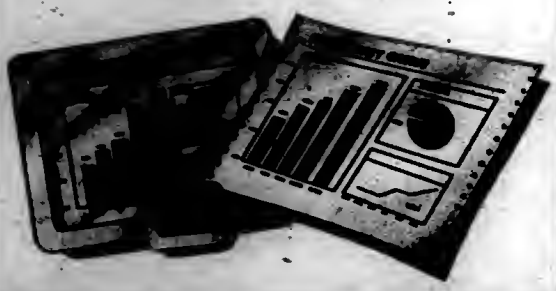

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PEOPLE

PEOPLE ON THE MOVE

GEORGE SCHERER was promoted to director of data processing and systems operations of New York Racing Association, Inc.

Prior to his promotion, Scherer was systems manager at Honeywell, Inc. from 1965 to 1969 and served as an IBM sales representative from 1963 to 1965.

Scherer, who has served as director of systems, assistant director of Mutuels Tote System and DP, also assisted the director of mutuels in day-to-day operations.

The promotion was part of a reorganization implemented which realigned the responsibilities of more than a dozen of the association's top management members.

The New York Racing Association operates New York's Aqueduct, Belmont and Saratoga racetracks.

Scherer graduated from King's College in Wilkes-Barre, Pa., in 1962.

■

RCA Government Communications Systems Division has appointed **BILL MOORE** as director of information processing systems in Camden, N.J.

In his position, Moore has overall responsibility for the design, development, production and fielding of a wide range of equipment and systems used by classified customers to collect, distribute and analyze information.

Previously, he was manager of programs management, a position he held since joining RCA in 1983.

Prior to joining RCA, Moore served for 31 years with the National Security Agency (NSA) in Fort Meade, Md., where his last assignment was special assistant to the deputy director of research and engineering. While with NSA, he held management positions in research and engineering, long-range and strategic planning, program management, contract administration and procurement.

From 1977 to 1983, Moore was responsible for the design, development and acquisition of line-of-sight systems for the cryptologic community, conducting a technology development effort that resulted in the successful translation of real-time spectrum analyzers, digital signal processors, acoustical-optical receivers and tunable millimeter-wave receivers into systems.

For four years, from 1973 to 1977, he was responsible for life-cycle support of the U.S. Signal Intelligence systems.

He holds a bachelor of science degree in engineering from the University of Arkansas.

■

JOSEPH MOTTO has been named management information systems director of the city of Phoenix.

Motto has 24 years of experience in the information processing field.

Prior to this, he was management information director for the city of Charlotte, N.C., for 12 years.

Before working with the city of Charlotte, Motto spent more than 12 years with Systems Development Corp., working either on weapon control systems or as an assistant technical director for the intregrated municipal information systems project for Charlotte.

As MIS director, Motto was instrumental in two computer conversion efforts. The first was in 1974 from RCA Corp. to Burroughs Corp., and the second was in 1980 from Burroughs to IBM. He also established a microcomputer support capability for city departments as well as introducing office automation techniques, including electronic mail and word processing.

Motto has a bachelor of science degree in geology from Pennsylvania State University and a master's degree in urban administration from the University of North Carolina at Charlotte.

■

GORDON SHACKLETT has joined

Shacklett

Summagraphics Corp. as director of information systems. His responsibilities include directing computer operations, programming and systems development.

Shacklett comes to Summagraphics from National Micronetics, where he was data processing manager.

He holds a bachelor of arts degree from California State University at Fresno.

Founded in 1972, Summagraphics is a leading manufacturer of digitizers and a supplier of low-cost computer-aided design systems.

■

JEFF LAUFHUTTE has joined Prodigy Systems, inc. as manager of information systems, a new position.

Prodigy recently formed a management information systems department and is installing a computer system to integrate its purchasing, inventory, billing and delivery functions.

Laufhutte was a former management consultant with Arthur Young & Co.

Laufhutte, as a consultant to Top Rank, Inc. in New York, a promoter of prize fights, developed a data base system to track the records of boxers throughout the world.

He holds a B.A. in Computer Information Science and an MBA in Management Information from Iona College in New Rochelle, N.Y.

■

MICHAEL F. JOHNSON, MICHAEL R. FROST, H. LEE WEST, R. KEITH CAMPBELL and **W. TOM HENRY** have joined or been promoted by Coca-Cola Bottling Co. in Charlotte, N.C.

Johnson is director of management information services. He will assume responsibility for all corporate data processing functions.

NEWS

Prior to joining Coca-Cola, Johnson was a senior manager with Price Waterhouse & Co. in its management consulting services division.

He graduated from Virginia Commonwealth University with a bachelor of science degree in business administration and management.

Frost joined Coca-Cola as manager of systems and programming. He will have overall responsibility for the evaluation, development, implementation and maintenance of central corporate management information systems.

Previously, he was a senior systems analyst with Ingersoll-Rand Co. in Charlotte, N.C.

Frost holds both undergraduate and graduate degrees from the Georgia Institute of Technology in applied mathematics and information systems.

West has joined the company as manager of technical services. He will be responsible for all technical software support functions.

Previously, he served as the data base administrator for Ingersoll-Rand in Charlotte.

He graduated from Lynchburg College in 1978 with a bachelor of science degree in business administration.

Campbell has been promoted to manager of operations and will be responsible for all facets of the company's data processing operations.

Campbell joined the company in 1974 as a computer operator and has held various positions within the department. These positions have been in both the operations and systems areas.

Henry has been promoted to manager of branch support systems. In this position, he will have overall responsibility for the development, implementation and maintenance of information systems used by outlying branch operations.

Henry joined the company in 1983 and was project manager in the systems area. Previously, he was employed by Computer Systems, Inc. as manager of the computer services division.

Henry graduated from Limestone College with a bachelor's degree in business administration.

■

JOHN J. FLAHERTY has been named manager of computer services at Boston Gas Co. He is responsible for the company's computer technology and computer operations.

Flaherty joined Boston Gas in 1970 as a management trainee and served in several capacities in the company's information services department, including assistant manager of computer services and director of computer operations.

Flaherty

He is a 1966 graduate of Boston College High School and received his bachelor's degree in business administration from Boston College in 1970.

■

ALAN GUIBORD has joined Tiburon, Inc., as vice-president of management information systems. His responsibilities include information processing, data center operations, office automation and telecommunications.

Most recently, Guibord has been senior director of MIS at Gould, Inc.'s computer systems division in Fort Lauderdale, Fla.

Previously, he was director of management information systems for Inforex, Inc., both prior to and following its acquisition by Datapoint Corp.

■

RICHARD D. KERR has been appointed director of corporate information resource management for Johnson Wax in Racine, Wis.

Kerr joined Johnson Wax in Canada in 1961. He has held a number of management positions in corporate information resource management, both in the U.S. and in Europe, including director of information resource management support — Americas, Pacific and Far East — and director of information resource management support — corporate and U.S. operations.

Since January of 1983, he has been assigned as assistant to the executive vice-president of U.S. consumer products.

He graduated from Marquette University with a B.S. in finance and mathematics.

CALL FOR PAPERS

THE FIRST ANNUAL INTERNATIONAL COMPUTER GRAPHICS IMAGE CONTEST
San Francisco, July 23

This contest is sponsored by Raster Technologies, Inc. and the Boston Computer Museum. Entries must be submitted in 35mm color slide format. In order to retain image clarity during judging, please submit two original slides per image entry.

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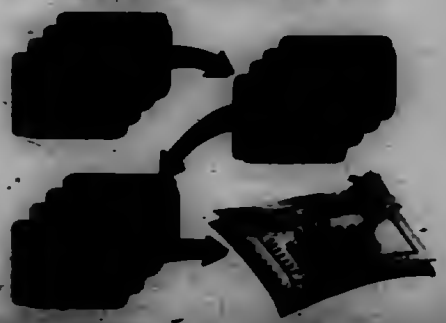

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NEWS

CALENDAR

WEEK OF JUNE 9

JUNE 10-11, NEW YORK — Strategic Planning and Information Systems. Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

JUNE 10-11, FORT LEE, N.J. — CICS/VS Performance and Tuning. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 10-12, NEW YORK — Data Communications Network Design, Integration and Applications. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 10-12, FORT LEE, N.J. — Vsam: Its Structure and How to Use It. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 10-14, ATLANTA — CICS/VS Internals. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 10-14, BOSTON — CICS/VS Application Programming — Command-Level. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 10-14 in Chicago and Los Angeles.

JUNE 10-14, CHICAGO — Fourteenth Annual Meeting of the Mumps Users Group. Contact: Conference Department, Mumps Users Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-14, NEW YORK — CICS Command-Level Programming. Contact: Synsd, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 10-14, ATLANTA — CICS/VS Application Programming — Macro Level. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 10-14 in San Antonio.

JUNE 12-13, FORT LEE, N.J. — Recovery/Restart. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 12-13, BOSTON — Tools and Approaches for Managing the Applications Base. Contact: Registrar, Nolan, Norton & Co., One Forbes Road, Lexington, Mass. 02173.

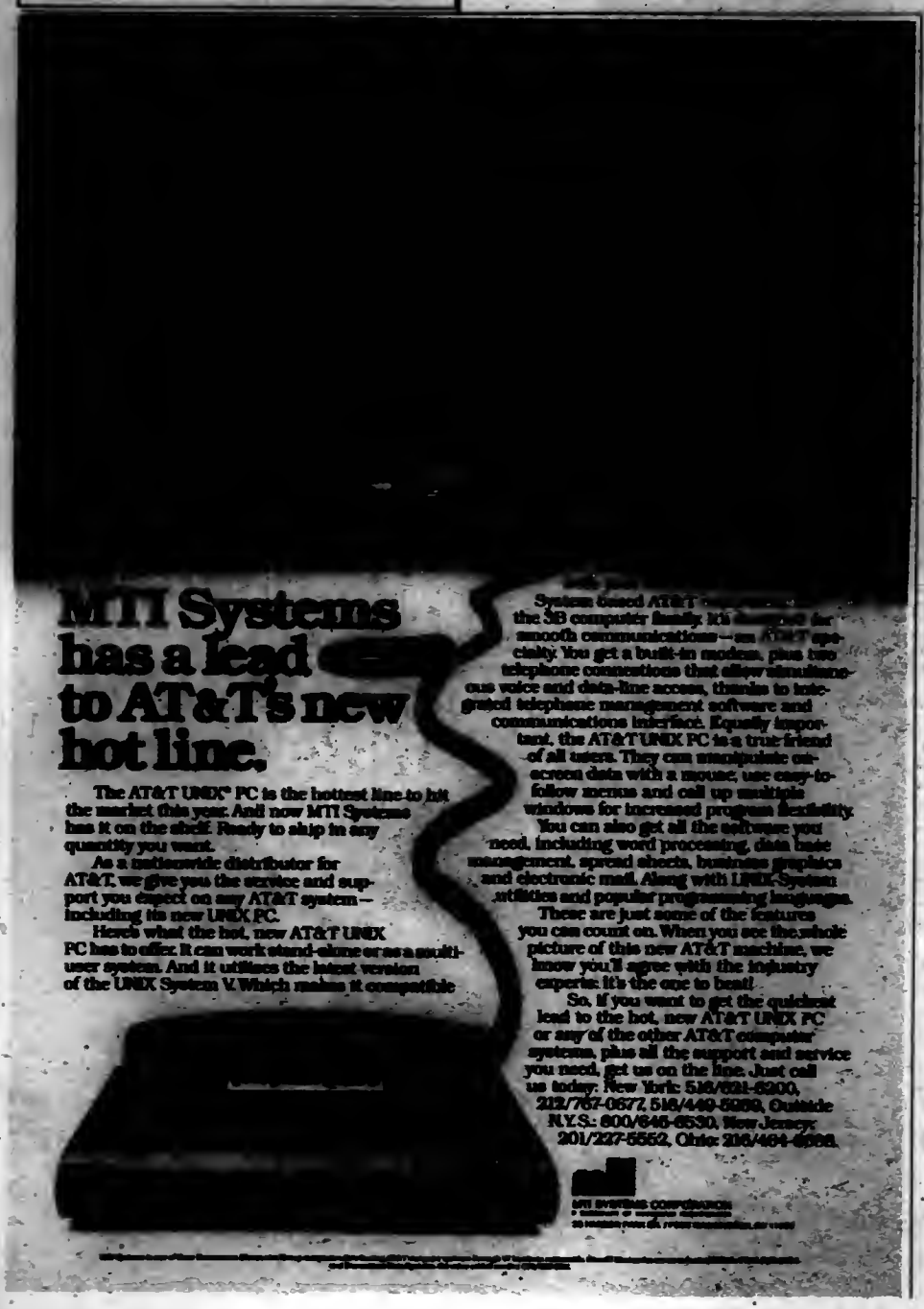
JUNE 12-14, ANAHEIM, CALIF. — Info/West: The Western Information Management Exposition & Conference. Contact: Show Manager, Info/West, 909 Summer St., Stamford, Conn. 06905.

JUNE 13-14, SAN FRANCISCO — Pacific Telecom and Telecommunications. Contact: Telestrategies, Inc., P.O. Box 811, McLean, Va. 22101.

JUNE 13-14, LOS ANGELES — Data Communications and Networking for the IBM Personal Computer and Other Personal Computers. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810. Also being held July 8-9 in Atlanta and July 22-23 in New York.

WEEK OF JUNE 16

JUNE 17-18, NEW YORK — Managing the Data Center. Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.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MTI SYSTEMS CORPORATION

NEWS

JUNE 17-18, TORONTO — Planning Corporate Communications Networks. Contact: Sheridan College of Applied Arts & Technology, Conference Centre, Trafalgar Road, Oakville, Ont. L6H 2L1, Canada.

JUNE 17-19, PHILADELPHIA — Administrative Management Society (AMS) /Roma Expo. Contact: AMS, c/o 119 Avant Garde, Kenner, La. 70065.

JUNE 17-19, NEW YORK — Third Annual PC Expo Conference Program. Contact: PC Expo, 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

JUNE 17-19, HOUSTON — CICS Internals for Systems Programmers. Contact: Betty Bruce, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

JUNE 17-19, TORONTO — CICS Command-Level. Contact: Betty Bruce, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

JUNE 17-20, NEW YORK — The National Data Base and Fourth-Generation Language Symposium. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 17-21, LOS ANGELES — Structured Analysis & Design Techniques Workshop. Contact: Elise Rabasis, Learmoth & Burchett Management Systems, Inc., Suite 406, 2800 N. Loop W., Houston, Texas 77092.

JUNE 17, CAMBRIDGE, MASS. — Center for Information Systems Research's 16th Annual Summer Session. Contact: Center for Information Systems Research, Sloan School of Management, MIT, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-19, BOSTON — Backup Network Planning. Contact: EDP Security, Inc., 181 West St., Waltham, Mass. 02154.

JUNE 17-18, NEW YORK — Fundamentals of Information Processing for Non-technical Executives. Contact: New York University School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022. Also being held June 24-25 in San Francisco and June 27-28 in Washington, D.C.

JUNE 17-19, BOSTON — Long-Range Information Systems Planning. Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

JUNE 17-20, FORT LEE, N.J. — CICS/VS Logic and Debugging. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 17-20, CHICAGO — IMS/DC Programming. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 17-20, FORT LEE, N.J. — CICS/VS Application Menu Design. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 17-20 in Los Angeles.

JUNE 17-20, BOSTON — Years From Start to Finish. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 17-20 in Atlanta.

JUNE 17-20, SAN ANTONIO — CICS/VS MRO/IRC. Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 17-20, WASHINGTON, D.C. — Association of Information Systems Professionals' Symposium XIII Annual Office Automation/ Information Systems Conference and Exposition. Contact: James J. Denio, 1015 N. York Road, Willow Grove, Pa. 19090.

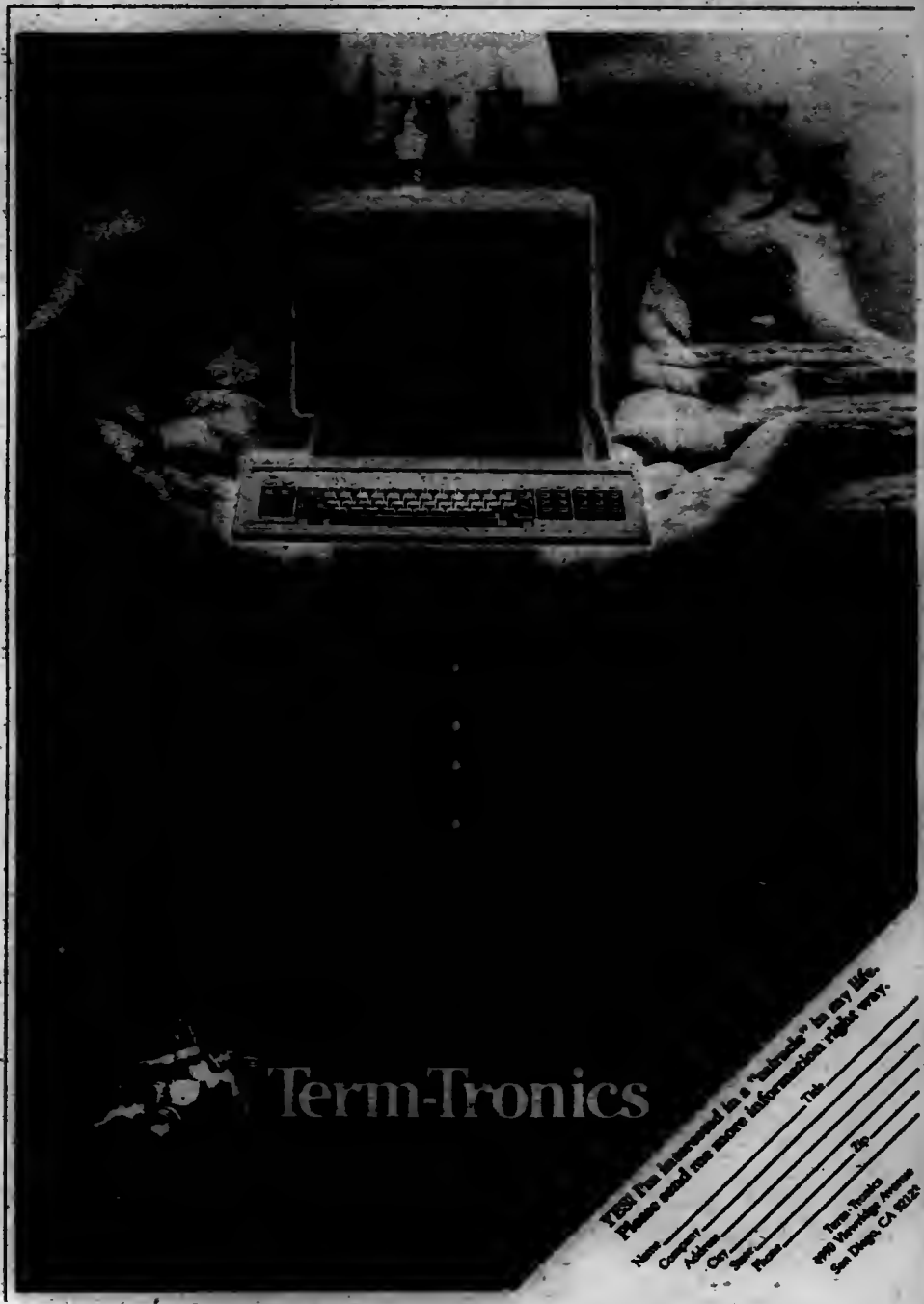
JUNE 17-21, NEW YORK — MVS JCL. Contact: Synsd, Inc., 36 W. 36th St., New York, N.Y. 10001.

JUNE 17-21, NEW YORK — CICS Macro-Level Programming. Contact: Synsd, Inc., 36 W. 36th St., New York, N.Y. 10001.

JUNE 18-20, ROSEMONT, ILL. — 1985 Advanced Manufacturing Systems Exposition & Conference. Contact: Online Conferences, Inc., 989 Ave. of the Americas, New York, N.Y. 10018.

JUNE 19-21, ATLANTA — VM/SP Structure, Flow and Tuning. Contact: Betty Bruce, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

JUNE 20-21, SAN FRANCISCO — Fundamentals of Data Processing for Administrative Assistants and Secretaries. Contact: New York University School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.



EDITORIAL

Go with the flow or don't go at all

Who is the chief information officer and what does this person do?

In an industry known for its fondness for new labels and acronyms, the CIO title is beginning to appear with some frequency. Logically, the CIO is at the top of the information management structure within a corporation.

That's a spot that traditionally has belonged to the MIS executive. But a chief directive for the CIO is to use computer power to achieve overall corporate directives. Too many MIS executives have not realized that if they don't learn to control and guide their firms' investment in technology, someone else within their company will move into the CIO spot to do just that.

American Airlines, Inc.'s passenger reservation system is a classic example of using information processing to reach corporate goals. The system initially favored American Airlines' flights over those of competing airlines. By the time the U.S. Department of Justice ruled against that practice, the terminals were already in travel agents' offices and competition was effectively locked out.

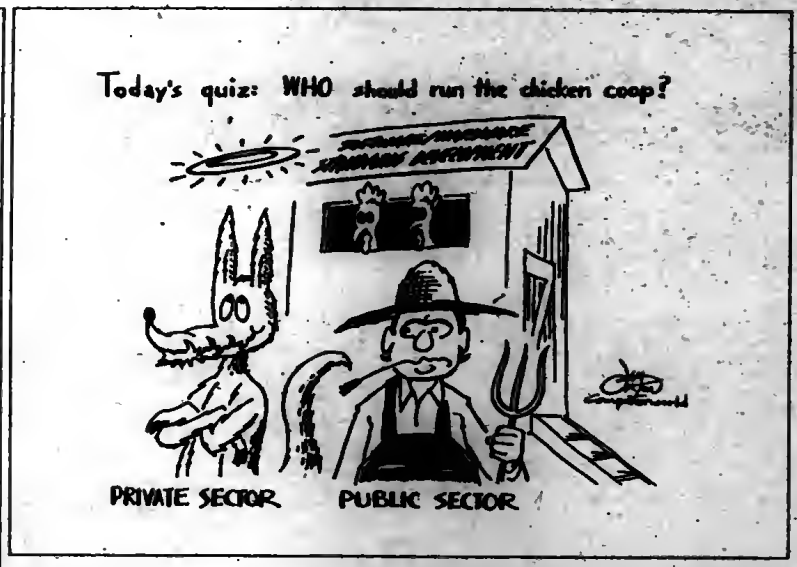
Information processing managers would do well to emulate the kind of thinking that went into developing the American Airlines system. But too many MIS executives are not aware that tying information processing to the strategic goals of their companies has become a necessity rather than an option.

Xerox Corp. executive and author Paul Strassman maintained that the reasons for this failure to understand the need to maximize their companies' competitive strengths is a simple one [CW, May 6]. Most MIS executives haven't been trained to direct the investment of the information technology that they control.

That may be true. But the reasons why MIS executives fail to align themselves with corporate strategies are really unimportant. It is essential that they move immediately to add another skill to their repertoire if they want to stay in control of the information processing function.

MIS directors who do not or cannot fill their expanded roles by learning to think in terms of strategic high-technology investment may well find people from other areas of their companies taking over high-level MIS functions.

Those who don't want to find themselves reporting to a CIO who comes from another area of corporate operations have just one choice. The information processing executive must learn to think in terms of corporate goals and put information technology resources squarely behind achieving those goals.



LETTER

Specifics of VDT fixes helpful

After reading numerous articles defining problems with VDTs, it was nice to read "Optometrists write prescription for VDT eyestrain" [CW, April 1], which described some solutions to the problem.

It is very rare to read about specific measures, such as "tinted polarizing glasses" and "luminance of about 35-ft candles," in trade journals or vendor publications. The general lack of supporting documentation leaves many of us experimenting with various fixes that are not often endorsed by our organizations or budget people.

I discovered that it helps to put a cardboard hood around the VDT, which has been criticized by coworkers as unsightly; turning off half the room lights, which others turn right back on; and getting a circular polarizing VDT filter.

Another fix is getting prescription reading glasses to relax my 20-20 vision eyes, which have a hard time focusing on the VDT light source — as opposed to print on a flat surface. I hope more articles that document other fixes for the VDT eyestrain problem are forthcoming.

Randall L. Bishop
Littleton, Colo.

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VIEWPOINT

The cable quest: abracadabra in Akihabara

LEGAL
SIG SOMMER
Charles P. Lecht

Part one of a two-part series.

This is a tale of intrigue and mystery in electronics. Although it ends in New York, the episode took me to many places here and abroad and ultimately to Akihabara, Tokyo's amazing electronics megamarketplace. In the many sidewalk concessions, shops and large department stores there, it is said that anything can be found.

My travel episode began in February, on board a plane from Tokyo to New York. I had just purchased a portable laptop with disk and printer and was waiting for it to be unpacked until takeoff, anticipating the fun it would provide during the long hours ahead. I wasn't disappointed: Indeed, I marveled at its spirited response once energized by the precharged, long-lasting batteries that were provided with it. It did everything I expected and even more. I even admired the manner in which the hardware and programs were presented. After a brief period of practice, I took to giving spontaneous demonstrations to passers-by. I even wrote the pilot a letter, perhaps the first of its kind entered and printed on board an airplane.

I was having so much fun with the system that I didn't give it a second thought when I observed that an RS-232 cable was missing — a cable essential to transfer my files between my new laptop and two older, more powerful desktops in New York and Tokyo.

I have been getting a bit more organized than usual in my work — for example, more than six months ago I began to archive my work in the two land-based systems. I recently made preparations to link these two systems in what may be the world's smallest personal network spanning the longest distance. I planned to dump the laptop's memory into the computer in the U.S. or Japan, depending on which end I was located in, and have access to them from either location with minimum communications costs.

> *I was having so much fun with the system that I didn't give it a second thought when I observed that an RS-232 cable was missing — a cable essential to transfer my files between my new laptop and two desktops.*

However, carrying this off depended upon the cable, whose absence I had overlooked. I looked at it this way: Without the cable, anything I entered in my airborne laptop would have to be re-entered on the ground if it was to be archived in my files.

It is not uncommon for rational business people to enter a "twilight zone" when a new gadget is delivered. I confess to this. Some of us are motivated to put up with defects in original equipment because of the fear that worse damage may result to our new wonders from a visit to a repair shop even before the first battery charge had run out.

Now, obtaining even a two-foot connector cable may not be all that easy, even if thousands are out there somewhere. You have to know where to go and whom to ask if you don't have an address. And what's worse, experience has taught me that if you don't have the time to research the matter, you may well have to learn to live without the equipment you desire — which is also likely if you don't maintain friendships in the technical community.

On arrival in Manhattan, I realized how important the cable was to my plans. I had two options. I could re-enter the work I'd done on my laptop on the plane into my New York desktop system, or I could maintain two archives, at least until the cable could be found. One archive — distributed to and maintained in two systems 12,000 miles apart — was hard enough to accomplish. If I chose the latter alternative, I would have had two archives distributed to those systems. So, I decided to begin re-entering the data and embarked on a quest for the missing cable.

I called the laptop manufacturer to ask where I might purchase the cable, and I learned the cable was not yet being distributed. I quickly discarded the possibility that the cable would not be available for a long time, assuming that at least one of my friends in the U.S., Japan or Europe would know how to find or make the cable.

Well, you know how these things go — time passed and I didn't find the cable or someone to produce it.

Further aggravating the situation was the fact that I didn't have time to research the matter. In fact, I hardly thought about the quest until the next time I needed the cable. By then I strengthened my resolve to get it one way or another, and that "another" category included going to a trade fair where the laptop's manufacturer could possibly be demonstrating the system with one of the now-present cables and "lifting" it. The moral jus-

See CABLE page 53

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

System conversion tips to bet on for IRS-style results

HUMAN
CONNECTION
Jack Stone

From all the news accounts of the transitional travesties at our beloved Internal Revenue Service data processing installations, the discerning data processor would think that the year was 1965, when installations of the then radically new IBM 360s were in full swing and the trade press was bulging with stories of conversion disasters.

Did you note the news clips, and did they seem familiar? "More than three million lines of code had to be checked out ... underestimated degree of difficulty of the task ... new equipment plagued with more than a normal share of bugs ... complex communications system ... system didn't perform parallel testing ... insufficient conversion aids ... programmers lacked the necessary experience."

Of course, these days, one doesn't have to be a dyed-in-the-wool programmer to express annoyance — if not disgust — at the IRS' inability to get its act together. Most of the public knows when a consumer-oriented system is malfunctioning, and the untold millions of end users of the IRS' taxpaying system who will not receive timely tax refunds and are not "computer aware" will consider their introduction to systems problems a particularly poignant experience.

> *How in the world could the IRS have fouled up so badly? The IRS' DP management, most likely, ignored the lessons of history and proceeded to take certain enormous and unnecessary gambles on completing the conversion on time — and then it lost that gamble.*

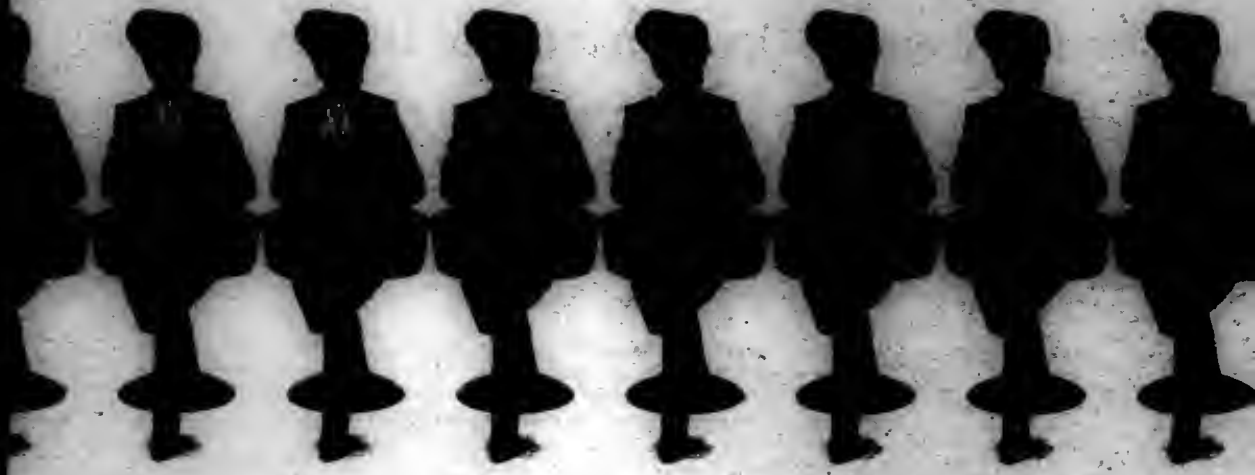
Perhaps in a few months the checks will finally arrive, the down payments on new cars and TV purchases will be completed, and the incident will be forgotten. But the nagging question will remain: After all that is known and has been written and taught on the subject, how in the world could the IRS have fouled up so badly?

I am forced to conclude that the IRS' DP management either didn't know what it was doing, which is not too bad an excuse in view of the enormous complexity of the system; didn't care about what it was doing, which is highly unlikely in view of the prospect of being grilled by the legislature on Capitol Hill for malfeasance; or, most likely, ignored the lessons of history and proceeded to take certain enormous and unnecessary gambles on completing the conversion on time — and then lost that gamble.

What follows is a brief set of guidelines for those seeking hero status as leaders of conversion efforts which, either independently or in concert, are guaranteed to result in cutover delays, screaming users, programmer resignations and excessive costs.

- Present the conversion project to the analysts and programmers as the "DP challenge of a lifetime, which only the most elite can accomplish," then work them day and night for months on end — or at least until a few team leaders quit without having trained their replacements.
- Take full opportunity of the conversion effort to simultaneously install new hardware, introduce a new operating system, develop new applications programs, extend communications facilities, move to a new location and replace the old system without running it in parallel.
- Make certain that the initial release of the application system is "full-featured" so that it satisfies the wish list of every politically important user manager, ignoring the extra-heavy programming effort required to do this.
- Be sure to delay the usual system documentation chores until the cutover is completed so as not to divert the systems folks from their primary mission. Defer a user training program for the same reason.
- Commit in a meeting of top management — or, to be more dramatic, before a mass meeting of the user population — that the conversion will be completed on time, to specification, within budget. This strategy may result in a particularly poignant experience for you because you may find yourself pounding the pavement, looking for a new job. ‡

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.



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VIEWPOINT

Software warranties ease glitches for users, vendor

READER'S PLATFORM
Leon F. Stewart

I would like to comment on the column "User bugged by distribution of defective packages" [CW, April 8] that discussed the problems encountered when software is not properly supported or warranted by the software developer.

I have never experienced the frustrations described by the author, probably because I have never been active in the microcomputer software area. However, I have been active in the IBM System/34, 36 and 38 area as a purchaser and software vendor, and I have seen some of the problems mentioned.

I encourage all software vendors to offer better warranties on their products. My company, Britz Publishing, Inc., has sold thousands of software packages on a money-back-guarantee basis since it began selling software in 1982. Britz would not consider doing business any other way. Users and vendors alike would be better off with better software warranties.

The absence of a good software warranty contributes to the software piracy mentality. Because the software purchaser generally has no recourse when confronted with a defective software package, he is being told, "you bought it, you own it." Because he owns the package, he is likely to feel no remorse in letting others copy it. The idea may develop from a defective package, but it is easily transferred to a good package.

What has a software developer got to lose if he offers a money-back guarantee? It would seem that few people would take advantage of the situation just to try a package they really don't intend to keep. Unfortunately, however, software vendors are often guilty of this tactic. When an order comes in to Britz from another software vendor, I know from experience that there is a great likelihood that the vendor will ultimately return the package. Perhaps a software vendor has higher standards than other users. I suspect that in many cases, it is just one vendor wanting to look at another's product.

On the other hand, many people will make a purchase because they feel safe thinking that if the package is defective, they have a remedy for the problem. The purchaser will develop a better attitude toward the vendor and is more likely to reward the vendor's good faith with good faith in regard to protecting the vendor's rights.

With a no-warranty software package, the vendor is saying in effect that he doesn't have faith in his own product. The software vendor should be able to say, "This is a good product, and it will do what we say it will do. If it doesn't do what we say, bring it back to us."

Perhaps the chief reason software vendors do not want to offer a substantial warranty is that they hate to make refunds. It used to pain me to write a refund check. I have come to realise that giving refunds is just another cost of doing business. It is part of the price my firm pays for selling to the 95% of its users who are satisfied and don't ask for a refund.

The heart of the software warranty problem is the software itself. It is fairly obvious that a lot of software is being sold that contains bugs of one sort or another. I am not so naive as to suggest that it is possible to market software that is 100% bug-free. The real solution is testing the software before it is put on the market and correcting the discovered bugs before and after the sale. After a software vendor has packaged 100,000 shrink-wrapped boxes of diskettes and manuals and has shipped them to retail stores, it is very difficult to correct a program bug no matter how small or large.

It is extremely difficult, if not impossible, to anticipate all potential user situations. There must be numerous test sites and a lengthy time period before a software product can even begin to approach the circumstances it will encounter on the general user market. This time factor is one of the biggest problems.

When bugs are found in a product after it is on the market, the vendor must provide the purchaser with a corrected version. The only real question is the cost of the correction. If the package cost is more than $1,000, undoubtedly the correction should be free. For lower price packages, there should be a moderate fee in the $20 to $50 range. Chances are that enhancements will accompany the bug-free version. The vendor actually may be correcting functional situations not addressed by the software's original design.

The software vendor will at least break even on the sale of corrections and update. A hot seller might need several thousand upgrades at $50, which computes to a substantial sum by anyone's standards. Who wouldn't like the chance to sell a new set of diskettes at $30 each to half of the users of any one of the top 10 micro packages? ‡

Stewart is president of Britz Publishing, Inc., a Jackson, Miss., software vendor.

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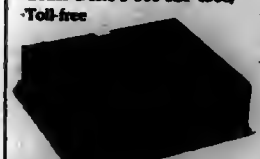

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LETTERS

Pundits' analyses refuted

Here are a few observations on the column "Osborne foresees price plunge" [CW, March 18] and on the pundits who the writer contacted following my presentation at the Association for Systems Management meeting.

Dealers are putting up a brave front regarding prices holding at the high end of the software market, but you only have to scratch the surface to discover that prices are, in fact, collapsing. If Robert Lefkowitz really believes that customers are now looking for more power and capabilities in high-priced software packages, then he must have been out of the country for the past two years. Does Lefkowitz really believe that the average word processor user has now fully explored all the capabilities of high-end word processors and that they are champing on the bit for yet more word processing features?

Most word processor users have not begun to tap truly the capabilities of their software and wouldn't know what to do with the new features they're being offered, because they never really use the features they have. I speak before many audiences, and more power at the same price is not what the buying public is looking for. What they are getting is an attempt to maintain high prices, and that's certainly not what the customer is looking for. Customers are looking for lower prices: That is why prices will fall as sure as night follows day. With regard to word processors, you might be interested to know that many of the high-end, expensive word processors are now so feature laden that typists cannot type more than 50 words a minute without going ahead of the software.

There is no way anyone can sell an inexpensive product and let every user call in at the company's expense. We used to keep score at Osborne Computer Corp. of the number of people who called in complaining that their computers wouldn't work when they had not even turned on the power switch yet. The small charge we make has, in fact, reminded our customers that they were taught to read in grade school. We have an complaints from anyone regarding the charge for support. The quality of the documentation is so good that we have had just two calls for a total net revenue of $10 to date.

Osborne most certainly has no intention of taking a shotgun approach, we choose our product very carefully, because we write all of the documentation supporting the software, and we insist on the software being modified to meet our keyboard and user interface standards.

Where did Mary Ellen Dick get her information that Osborne pays its authors penalties? She never called us for any facts. The truth of the matter is that we pay some of the highest royalty rates in the business.

You might suggest that these three pundits check with me before attempting to tell the world inaccurately what I am doing.

Adam Osborne
Hayward, Calif.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer. Letters may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

CABLE from page 40

tification for this tactic could doubtlessly be argued using classic civil disobedience logic, which justifies committing minor crimes against a giant entity by attempting to increase vastly its honesty.

I actually went to a gigantic computer exhibition in March, knowing the manufacturer would be there, hoping that the cable would be there too. Although I did not intend to "lift" the cable if it was there, I did intend to appeal for it so convincingly to the company's booth attendants that the sense of justice in one of them might compel him to secretly hand the cable over to me.

No such luck. The manufacturer was there all right and so were the attendants, but the cable was nowhere to be found.

I've been around long enough to know that a missing part or two commonly accompanies the introduction — if not the early deliveries — of a computer system. Even though I was dismayed at having to continue to re-enter all the data that I produced in flight to my system in New York as I waited for the missing cable to materialize, I wasn't too surprised.

And the search continues

When the opportunity presented itself, I resumed my search for the cable, but whether I was in the Silicon Valley, Dallas, Tokyo or New York, the answer was the same: The cable wasn't to be found. And although everyone I talked to knew the cable was easy to make, no one seemed anxious to make it; it seems that a special set of tiny instruments are required to carry off the manufacture.

And to add insult to injury, I had been carrying around the software needed to decode the laptop's transmitted data for some time — software that would map the data into code acceptable to my land-based systems.

All I needed was the cable to make the connection to my laptop. The conclusion of the this tale will reveal my new approach to the problem, how I carried it off and how it brought the cable to my very doorstep in the Big Apple.

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SOFTWARE & SERVICES

SOFTTALK
John Gantz
Old Senior Editor

Is IBM's DBMS glass half empty?

'The lack of functionality of IBM's data base management systems and the increasing user confidence in independent vendors' DBMS are really giving IBM problems in the DBMS market.'

Scott Smith, vice-president
The Gartner Group, Inc.

Is the glass half empty or half full? When it comes to the data base management system market, IBM might

See IBM page 76

SOFTLINE/WILLIAM INMON

Work unit key to on-line results

Second of a two-part series

Ted Codd, one of the pioneers of data base theory, is credited with saying that performance comparisons between relational and hierarchical, or on-line, data base management systems are biased because a limited amount of work done in the on-line environment is being compared to a massive amount of work done in the relational environment. Codd had hit upon the very essence of the difference between the two types of systems, and in doing so, has stated why relational systems cannot equal the performance of hierarchical systems.

Unquestionably, relational systems are flexible, certainly much more flexi-

See DBMS page 77

Boris Beizer

'Dedicated to several unfortunate, very bad software projects for which I was privileged to act as a consultant (albeit briefly). They provided lessons on the difficulties this book is intended to circumvent. ... Their failure could have been averted — regulament in peace.'

With that dedication, *Boris Beizer* opened his book Software Testing Techniques *(Van Nostrand Reinhold Co., New York), a practical guide for programmers implementing software testing methodologies. According to Beizer, most software development shops plans far too little emphasis on current testing methods. Proper software testing, he believes, can ensure cost-effective development projects and fewer software quality problems.*

Beizer is a consultant and director of testing and quality assurance for Ponemon, NJ.-based Data Systems Analysts, Inc., which specializes in the design of telecommunications software systems. He calls himself a "testing nut." His ninth book, which deals with personal computer software quality, will be published this fall. Beizer recently discussed software testing issues with Computerworld staff writer Maura McEnaney.

Q *What is your definition of a software test? Specifically, what are you testing?*

There is no formal proof that a piece of software is correct, so we accept the fact that all software will go out with a certain number of unpredictable bugs. The objective of all testing is to reduce the number of bugs to a pragmatically acceptable level. That is determined by the application, the market and a whole bunch of other things.

Q *Do you think companies today adequately test software?*

[Testing] ranges from superb in a very small minority of companies to unbelievably abominable. If you ask where the mean is, I'd say [it's] significantly lower than [it] is in their best interest [to be].

Q *What are companies routinely doing wrong?*

See BEIZER page 75

- Mapco has offered a data center planning service that tracks performance and expenses and models future requirements/89
- An enhanced release — dubbed Focus V — of the Focus fourth-generation language is out from Information Builders/89
- D&B Computing Services has announced a remote information center service based on its Nomad2 fourth-generation language/89
- A knowledge-based systems development tool has been unwrapped by Carnegie Group/89

INSIDE

Systems Software/89
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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes, to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as the standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one pointing the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes*? Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE are identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate applications programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are committed unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ What about Goldengate, dBase III, Symphony or Framework? PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 1060.

SPSS' tool translates DEC's stats

By Edward Vitmer
CW Staff

BEDFORD, Mass. — When the statisticians speak in chi-squares and the managers speak in profit and loss, a translator is needed. For the quality assurance group in the educational services division at Digital Equipment Corp. here, the translator that makes statistics comprehensible to corporate managers is the SPSS Graphics package from SPSS, Inc.

The SPSS Graphics version for DEC VAX-11 minis, which was introduced at the recent National Computer Graphics Association conference, was beta tested by DEC's quality assurance group. That group, which monitors the performance of DEC training programs around the world, uses the graphics package to produce between 30 and 40 charts per month covering such topics as student interests and attendance patterns. The charts are presented in reports to managers, most of whom do not work directly with statistics.

According to director Hossein Hosseini, the group was already using SPSS statistical analysis software — the SPSS-X Information Analysis System — when SPSS approached them to beta test the new graphics package. This was not the first statistical graphics package the group had used, but it was the first it had found that could operate with either extract data summaries from SPSS-X or with data input to it directly, he said.

Reshaping data unnecessary

Most graphics packages can work with raw data, Hosseini explained, but SPSS Graphics' ability to import files from SPSS-X meant that data and data definitions would not have to be rekeyed when users wanted to create a graph. Another plus, he said, was that SPSS Graphics could determine and display the variables in each SPSS-X system statistical file that it imports.

As a result, he continued, the user needs only to look at the file's variables to decide which to put on the horizontal and vertical axes or which, in the case of a bar chart, is the break variable. A statistician who wanted to create a chart on sales trends in each of several regions, for example, would put sales on the vertical axis, the financial quarter on the horizontal axis and designate each region — the break variable — with a differently colored bar.

Such a chart might not be interesting for a statistician, but it would be useful to an executive with little knowledge of statistics, he said.

Hosseini said the quality assurance group will keep SPSS Graphics, even though the software, which runs on a DEC VAX-11/780, had a few minor bugs in its beta version. Those bugs, he said, were corrected quickly by the vendor. The beta version of the package, he added, did not contain its promised library of state and national maps, upon which bar charts can be overlaid. A vendor spokesman said this feature has since been included.

Planning tool aids data center forecasting

By Jeffry Beeler
CW West Coast Bureau

DEL MAR, Calif. — A software company here has developed an automated planning system that is said to enhance data center forecasting by allowing MIS cost and performance models to be linked.

According to a spokesman for Miapco, Inc., MIS Planner (Misp) automates the process by which companies predict the impact of proposed business changes on systems expenses, requirements and performance. Misp combines two existing software products — a cost-modeling package from San Diego-based Performance Management Associates, Inc. and a performance-modeling system from Austin, Texas-based Information Research Associates, Inc.

In a typical application, the spokesman said, the cost-modeling package estimates a firm's hardware and personnel needs, projects its transaction volumes for the next year and computes, by month, the demand for each MIS activity. The module also figures the company's MIS budget for a given level of resources.

Next, the performance-modeling package calculates the utilization limits that will have to be set to maintain an acceptable service level. The results of the package's computations are then relayed to the cost-modeling system, where they are compared with Misp's estimates of future hardware use.

In addition to the cost- and performance-modeling systems, Misp reportedly contains an IBM Personal Computer XT front end and a methodology for gathering and formatting data from an MIS organization.

Miapco makes the automated planning system available in two options. The company will supply Misp plus a week of training, or it will adopt a turnkey service approach and assume full responsibility for a customer's forecasting project.

The Misp software and a week-long training course cost approximately $75,000.

Miapco can be reached at Box 2747, Del Mar, Calif. 92014.

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With Model 4, you're equipped with the perfect educational tool: Still Frame Audio. It compresses digital audio so you can extend a program to an

A new Sony semiconductor laser means a smaller player and higher reliability than Hallcon Mass knows.

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It goes from frame 1 to 54,000 frames in 15 seconds, the fastest access time and lowest waiting time in the industry.

And it comes equipped with the Sony name. Sony support and Sony's legendary reliability.

Automatic motorized front-loading mechanism controllable by the touch of a button or by an external computer.

SOFTWARE & SERVICES

Enhanced Focus release out from Information Builders

Interactive application tool also introduced

NEW YORK — Information Builders, Inc. has announced an enhanced release — called Focus V — of its Focus fourth-generation language, featuring full screen orientation for report creation and output presentation and an integrated editor and screen painter.

The company also announced a version of Focus for IBM's DOS/VSE operating system and a Focus-based interactive application called the Application Tracking System (ATS). According to a spokesman, ATS allows personnel administrators to manage the flow of job applicants and requisitions within an organization.

In addition to DOS/VSE, Focus is available for IBM VM/370 and MVS operating systems and a variety of data base management systems including IBM's DL/1, IMS, SQL/DS and DB2; Cincom Systems, Inc.'s Total; Software AG Systems, Inc.'s Adabas; and Intel Corp.'s System 2000.

The Focus editor and screen painter, dubbed Ted, provides a full screen applications development environment portable across all Focus versions. The editor is designed to handle I/O screen development and transaction processing logic. The screen painter allows users to develop data base applications in a single terminal session. Screen design is accomplished by layout of the screen in the Paint mode, assigning field names and screen attributes in the Assign mode and placing the screen into the Focus procedure with the Fidel mode.

Other features of the editor include simultaneous editing of up to four files in four screen windows; transfer of code or text between windows; automatic save and execution of Focus procedures from within the editor; and integration between Ted and the Focus Session Monitor, which logs all terminal activity.

The Ted editor and screen painter, an optional feature of Focus under CMS and MVS/TSO, cost $4,500 for a one-time license or $150 per month on a rental basis.

Other enhancements to Focus V include TSO file integrity, which ensures that either the physical data base or its shadow image maintains full file integrity in the event of system failure; generalized data hiding, which ensures that data-retrieval data is always sorted correctly; and schema enhancements that include data validation tests for specifying values used in transaction processing procedures.

The one-time charge for the VM/370 and MVS/TSO, CICS, IMS/DC versions of Focus V is $45,000 for a basic system and an additional $22,000 for the Focus data base management, transaction processor and interactive data base editor.

Focus for DOS/VSE is scheduled to be available in the third quarter. Also included in the DOS/VSE version are the company's Talk Technology facilities for creating data bases, modifying data and designing reports for novice mainframe users. Use of the facilities requires no knowledge of Focus or mainframe computing.

The one-time charge for the DOS/VSE version of Focus is $35,000.

ATS features

The ATS is said to handle all Equal Employment Opportunity and Affirmative Action Program reporting requirements, as well as produce standard management reports. ATS also includes Table Talk, Information Builders' menu-driven report generator.

The ATS applications package organizes data within file folders called screens. When an applicant's name is entered, a history record appears showing related job applications, their disposition and all corresponding job requisitions that apply to the candidate.

ATS reports include applicant, new hire, transfer and applicant detail reports. Management reports include job requisition by department, job requisition by recruiter, cost per job requisition, source summary and physical required report.

ATS operates on IBM mainframes under VM/CMS or MVS/TSO and requires the basic Focus system, with the Fidel Screen Manager option. The mainframe version is avilable for a one-time license fee of $9,000 or a monthly license fee of $240/mo.

A personal computer version of ATS is available for the IBM Personal Computer family, the Wang Laboratories, Inc. and Texas Instruments, Inc. Professional Computers and the AT&T 6300. The one-time license fee is $3,700 if Information Builders' PC/Focus is on the machine or $4,400 for a self-contained version including a copy of PC/Focus.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

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And in Model 5, you get all of the above plus digital data storage—it's a video disc and floppy disc in one, for creating training programs of unparalleled sophistication.

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Parallel interface (RS-232-C) provides a type of information terminal of a kit to allow quick transfer of digital data from video disc to external computer.

With the RS-232-C serial interface you have excellent software control over the player and a wide range of commands, including automatic feedback codes and player status queries.

These optional boards can be built in. They permit for possible player configurations, so you only pay for what you need.

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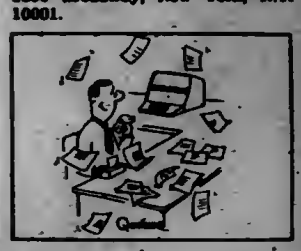


Carnegie Group unveils knowledge-based AI tool

PITTSBURGH — Carnegie Group, Inc. has introduced an integrated environment for developing knowledge-based systems on Symbolics, Inc. 3600 series, Texas Instruments, Inc. Explorer and Digital Equipment Corp. VAX computers.

According to a spokesman, Knowledge Craft is a productivity tool designed for knowledge engineers and artificial intelligence systems developers to aid in the development of knowledge bases for AI applications. Written in common Lisp, the product features Carnegie Group's Carnegie Representation Language for developing knowledge bases.

Knowledge Craft features a multiwindow interface and two-dimensional graphics capabilities to allow users to add graphics to multiple windows of text. In addition to its knowledge representation capabilities, the product offers inference strategy features for building AI knowledge-based systems.

Knowledge Craft costs $50,000, including first-year support, updates and training.

Carnegie Group is located at 650 Commerce Court at Station Square, Pittsburgh, Pa. 15219.

Remote access capability added to Nomad2 DBMS

WILTON, Conn. — D&B Computing Services, Inc. has announced that its Nomad2 fourth-generation language data base management system can now be accessed remotely.

According to a spokesman, the Remote IC service is available for any manufacturers' hardware. D&B uses a proprietary data transmission network to transmit Remote IC services from its data processing center in Stamford, Conn.

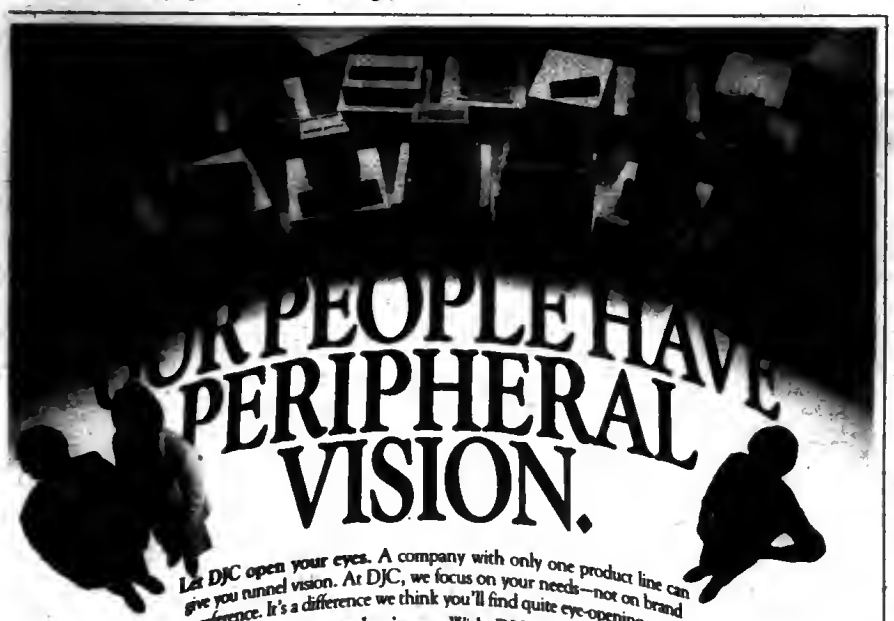
Users of Remote IC lease a fixed percentage of D&B's hardware capacity at a predetermined monthly rate.

For example, a buyer can purchase a Nomad2 license with processing power equivalent to 25% of an IBM 4361 mainframe, according to D&B Computing.

Buyers purchase the Nomad2 license and pay a preset monthly charge for the processing power and storage space leased.

One-year cost for the Remote IC is approximately $22,250, according to the vendor.

Additional information is available from D&B Computing Services, which is located at 187 Danbury Road, Wilton, Conn. 06897.



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SYSTEMS SOFTWARE

■ **Applied Software, Inc. has announced Data Set Manager (DSM), a full screen file management facility for IBM TSO users running MVS or MVS/XA.**

A spokesman said TSO DSM provides a full screen window to the user file catalog. Commands and file management features of the product are said to reduce TSO training time and improve TSO performance.

Support for IBM's ISPF includes an interface to PDF and a query facility for locating files by space allocated and used and last referenced date and volume. DSM's Dasd usage displays encourage users to delete unused files and release excess space of overallocated files.

DMS supports sequential files, partitioned data sets and members of a partitioned data set. All TSO commands are supported with DSM's customer-defined command table. A customer-defined exit facility is provided.

The monthly lease charge for DSM is $100, and the yearly charge is $1,100. For a second CPU, the prices are $80/mo or $880/year.

Applied Software, Suite 250, P.O. Box 13027, 840 U.S. Highway 1, N. Palm Beach, Fla. 33408.

■ **Productivity Products, Inc. has introduced software that operates in conjunction with IBM's DB/DC Data Dictionary to provide support for Information Builders, Inc. Focus users in IBM's MVS and VM/CMS environments.**

A spokesman said Focusout creates Focus file descriptions from the dictionary for flat files, physical and logical IMS data bases, CMS files and Information Builders' PC/Focus files. It also reportedly allows Focus files to be documented in the Data Dictionary along with conventional files.

Productivity Products' Focusin program enables users to populate the dictionary with information about their current systems.

Focusout/Focusin costs $15,000.

Productivity Products, P.O. Box 26, Vernon Hills, Ill. 60061.

■ **Software Systems, Inc. has announced Data Dialogue for linking IBM's System/34 and 36 with the IBM Personal Computer.**

According to a spokesman, Data

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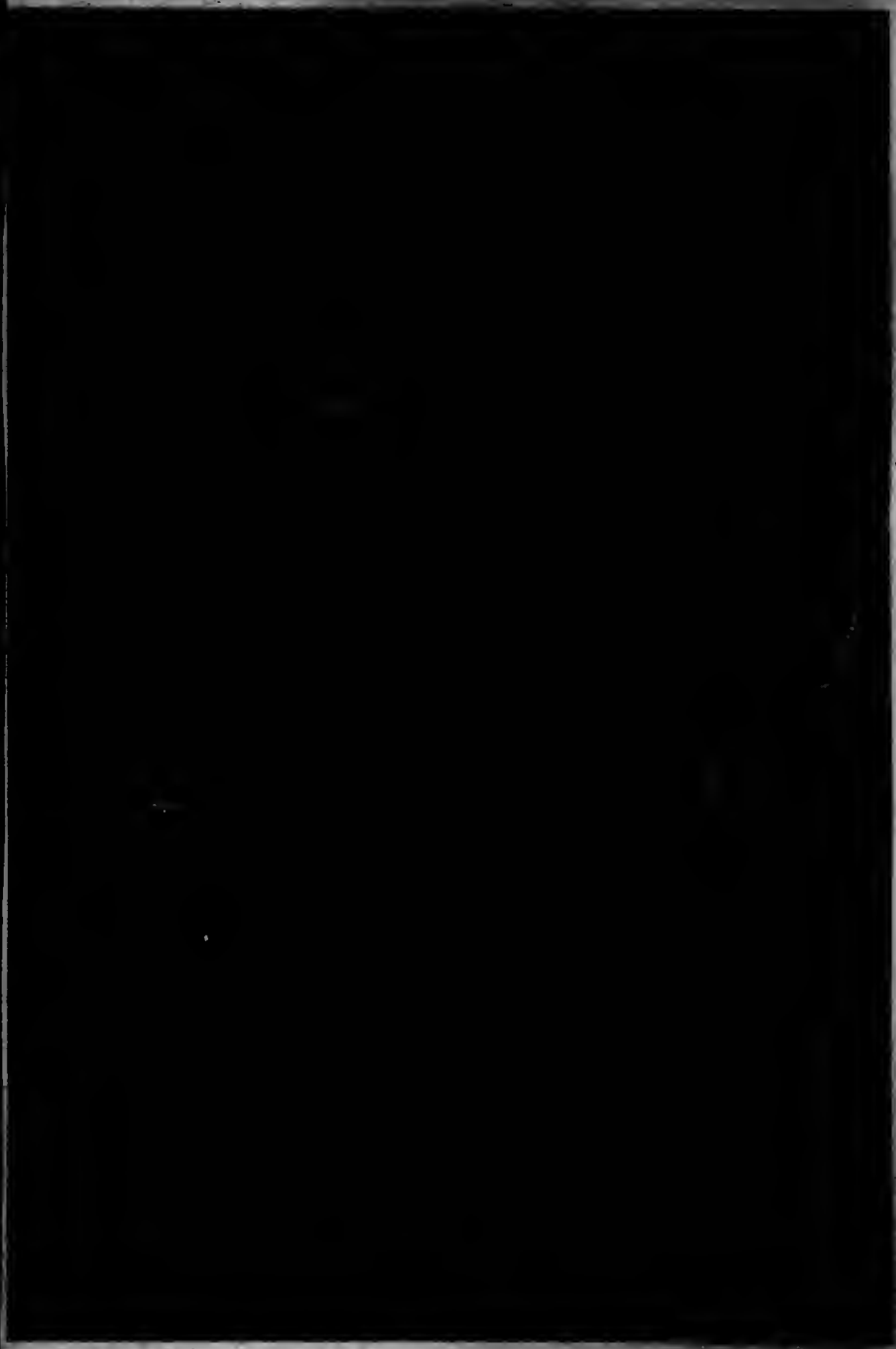

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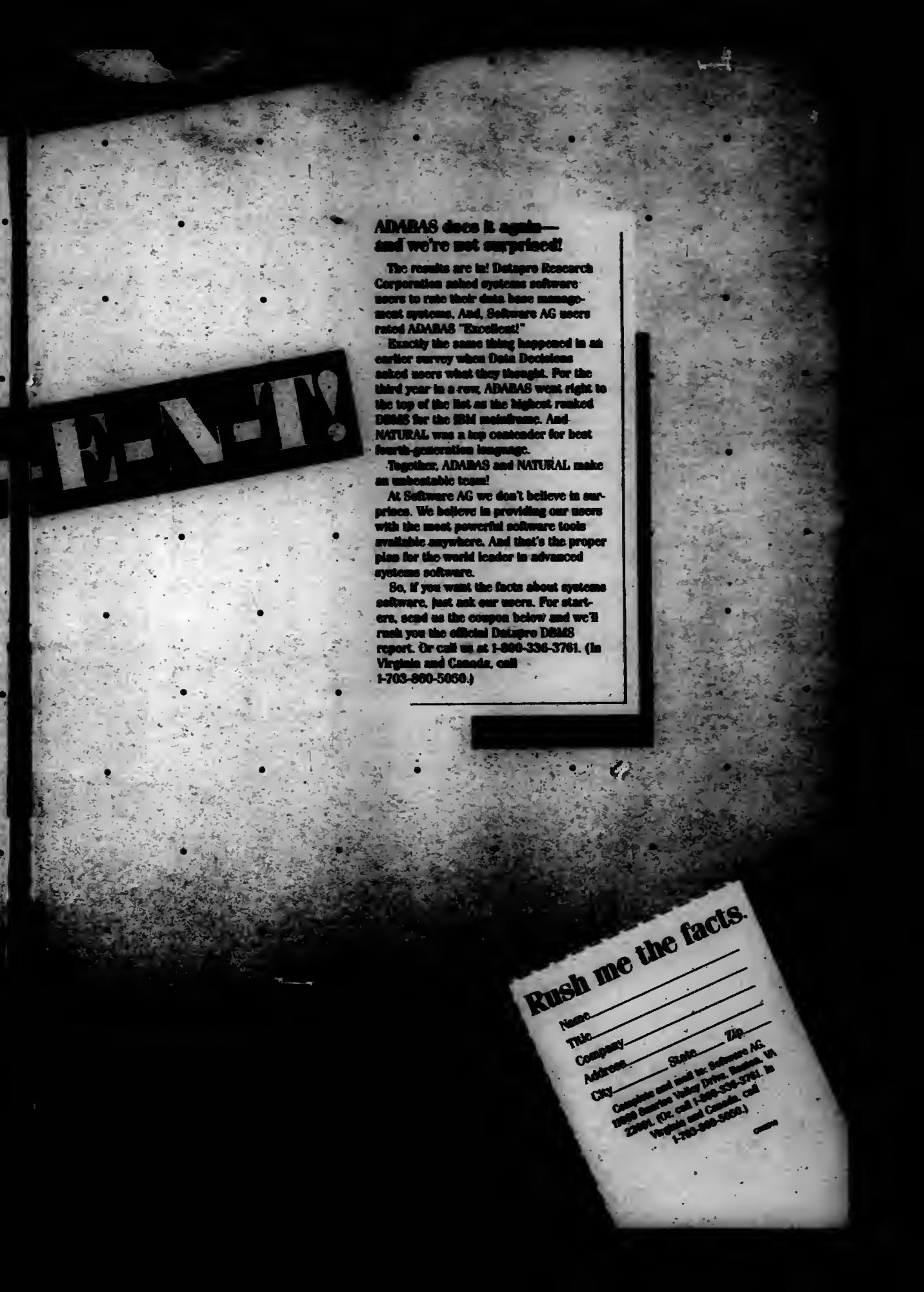
VMCENTER. It's a survival tool—and a whole lot more. For more information on VMCENTER, call or write VM Software, Inc., 2070 Chain Bridge Road, Suite 365, Vienna, Virginia 22182, telephone (703) [redacted].

[redacted]

E-X-

Software AG Users spell it out...Datapro™ survey rates ADABAS

E-X-C-E-L-L-


E-N-T!
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The results are in! Datapro Research Corporation asked systems software users to rate their data base management systems. And, Software AG users rated ADABAS "Excellent!"
Exactly the same thing happened in an earlier survey when Data Decisions asked users what they thought. For the third year in a row, ADABAS went right to the top of the list as the highest ranked DBMS for the IBM mainframe. And NATURAL was a top contender for best fourth-generation language.
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SOFTWARE & SERVICES

Continued from page 60

Dialogue is a data dictionary that enables System/34 and 36 users to select, retrieve, sort and reformat the data from their host systems for use in Personal Computer applications such as spreadsheets.

Data Dialogue enables users to select and retrieve individual files from up to 10 disk files at a time and reformat the selected data into multiple Personal Computer format types for integrating with Personal Computer applications.

Data Dialogue costs $1,250 for System/36 and $995 for System/34.

Software Systems, 308 Metro Drive, Jefferson City, Mo. 65101.

■ Executive Support Products, Inc. has announced Extended Printer Queuing — Image Queuing (XPQ-IQ) a print spooling package that runs on Honeywell, Inc. DPS 8, DPS 88 and Level 66 mainframes with Honeywell's Gcos III or Gcos 8 operating systems.

Reportedly, the product will support Honeywell's Data Management IV package when used for a transaction processing application. XPQ-IQ enables a time-sharing or batch user to queue a file and print it at a remote printer while continuing work at a terminal. Also, a user is able to send several reports to one printer or one report to several printers.

The software supports DM-IV subroutines that are functionally equivalent to Cobol Open, Write and Close statements, the vendor said.

XPQ-IQ costs $11,900.

Executive Support Products, Suite 211, 3901 MacArthur Blvd., Newport, Calif. 92660.

■ On-Line Software International, Inc. has announced Release 2.4 of Intertest, the company's IBM CICS testing and debugging programmer productivity tool. The product is available for IBM's MVS and DOS/VSE operating systems.

The Intertest menus have been enhanced to make them easier to learn and use, a spokesman said. In Release 2.4, logical separation of functions has been improved and the menus are more self-explanatory.

According to the vendor, breakpoint displays are provided for Cobol and PL/1 programmers. Messages have been improved, the source code and main storage display areas have been extended and PF key support is incorporated.

The price for Intertest Release 2.4 is $25,200 for IBM's MVS, and $21,000 for DOS.

On-Line Software, Two Executive Drive, Fort Lee, N.J. 07024.

PRODUCTIVITY AIDS

■ Touch Technologies has added an integrated screen management facility to its VAX Intouch applications development system for Digital Equipment Corp. VAX computers.

VAX Intouch Version 1.0 now allows users to create input screens without having to purchase a separate forms management system, a vendor spokesman said. Intouch options include block-mode terminal emulation, keystroke-level character validations and character translation capabilities.

Intouch costs from $5,000 to $40,000.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

■ MCRB Software, a division of MCRB Service Bureau, Inc., has announced two packages — Lifesaver and Analyze/R — for Cullinet Software, Inc. IDMS and IDMS/R data base management system users.

For users migrating from Release 5.7 to 10.0 of IDMS, Lifesaver is said to help create routines to aid in migrating applications between IDMS/R dictionaries.

Analyze/R will provide management and billing information about all facets of IDMS/R relational data bases. The product, processed in a batch environment, consists of an input parameters editor, a tool that selects required information from the IDMS/R area and a reporting tool.

Analyze/R also reports on unused and wasted space, provides departmental or applications cost breakdown, increases information regarding data security and usage and provides flexible cost factoring.

Lifesaver costs $4,700 and is available now. Analyze/R costs $16,500 through June 30 and is scheduled for June 1 shipment.

MCRB Software, 11633 Victory Blvd., N. Hollywood, Calif. 91509.

APPLICATION PACKAGES

■ Honeywell, Inc. has introduced the Account Reconciliation System for its DPS 6 computer system.

The Account -Reconciliation System reportedly was designed to assist banks in providing checkbook balancing services to large corporate accounts. The package is said to allow users to customize processing for their clients by selecting the type of reconciliation desired, the charge method, input media and formats, report content and retention period for data base information. A menu-driven set of modules is included.

Annual primary license for the product is $2,314, with an initial license of $5,000.

Honeywell, 300 Smith St., Waltham, Mass. 02154.

■ Hewlett-Packard Co. has announced an inventory management package for its HP 3000 minicomputers.

A spokesman said HP Invision includes capabilities for monitoring inventory using five forecasting as well as five different purchasing methods.

Users are then able to analyze usage trends for each inventory item, forecast the usage rate for the next period and determine if sufficient inventory will be available to meet demands.

According to the vendor, depending on the purchasing method, the system automatically considers the current inventory-holding costs, the amount of item usage throughout the year, the item quantity currently on order, recent item trends and the vendor's lead-time history.

HP Invision is priced at $25,000 and can be integrated with HP's SFD/3000 distribution management software.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

■ Unicalc Corp. has announced Micro Prompting for its mainframe spreadsheet package Unicalc/DB, for use with IBM's MVS and DOS under TSO or CICS and Cullinet Software, Inc.'s IDMS-DC under MVS and DOS.

The Micro Prompting feature allows users to go through a Unicalc/DB session without using the complex spreadsheet command syntax,

Continued on page 68

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SOFTWARE & SERVICES

Continued from page 64

according to a spokesman. With Micro Prompting, Unicalc/DB reportedly parallels the operation of micro spreadsheets such as Lotus Development Corp.'s 1-2-3. Users are led through a Unicalc/DB session with English-language prompts and displays of choices in a menu format.

Micro Prompting costs $1,000 as an add-on to Unicalc/DB. Unicalc/DB costs $11,000 for MVS, $6,500 for DOS on the IBM 4331 and 4361 and $8,500 for DOS on the IBM 4341 or 4381.

Unicalc, Two Academy Lane, Wayne, Pa. 19087.

■ **Cycare Systems, Inc. has announced the C900 health care applications package for IBM mainframes running the MVS operating system.**

The C900 reportedly allows large health care facilities — including health maintenance organizations, outpatient hospital clinics, medical school practice plans and large physicians groups — to automate patient accounting, scheduling, insurance billing, claims processing and premium billing.

C900 includes more than 30 applications packages said to be designed for patient care, patient accounting and administration of health maintenance organizations. It runs on IBM 4381 and 3080 series mainframes.

Price varies according to configuration. Software-only configurations range in price from $800,000 to $2 million.

Cycare, Suite 530, Dubuque Building, Dubuque, Iowa 52001.

■ **Outlook Software, Inc. has announced Outlook/AR Accounts Receivable System for the IBM System/36.**

According to a spokesman, Outlook/AR links billing, collection and accounts receivable reporting activities in financial and distribution systems. On-line cash posting, credit monitoring and history analysis capabilities are provided. Options are available for the automatic generation of general ledger transactions, a spokesman said.

Functions that assist users during cash posting operations include display of existing debit, credit or closed items. Transaction types available include invoices, payments, adjustments, miscellaneous cash receipts, finance charges and discounts. In addition, an unlimited number of adjustment transactions can be defined, the spokesman said.

Outlook/AR can run separately or in conjunction with Outlook/GL as well as with the Outlook/36 Financial Modeling System. It is priced at $8,500.

Outlook Software, Suite 117, 1 Woodfield Lake, Schaumburg, Ill. 60195.

■ **Visual Engineering, Inc. has announced that its line of AT&T Unix-based software products now runs on processors from a variety of vendors, including Amdahl Corp., Digital Equipment Corp. and NCR Corp.**

By coupling Unix with the Graphical Kernel System (GKS) and the C programming language, Visual Engineering can support the range of systems from a single source file, a spokesman said.

Visual Engineering products include Visual:GKS, a set of graphics functions for applications integration; Visual:C-Chart, a representation graphics tool set; and Visual:Prochart, a charting system for end users.

Systems running the software include the DEC VAX series, all Amdahl processors, the AT&T 3B2 supermini, NCR Tower running Unix System V, Pyramid Technology Corp. processors running Unix System III, Convergent Technologies, Inc.'s processors running Ctix and Sun Microsystems, Inc.'s Sun Workstations running OSX.

Visual Engineering software for Unix-based systems costs $600 to $36,000, depending on configuration.

Visual Engineering, Suite 200, 2680 N. First St., San Jose, Calif. 95134.

■ **Management Science America, Inc.'s (MSA) Health Care System software for health care costing and accounting for hospitals is now available to users of Applied Data Research, Inc.'s Datacom/DB data base management system.**

According to a vendor spokesman, the Health Care

Continued on page 70

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For more information contact: Harvard Software, Inc., Dept. D-H, 521 Great Rd., Littleton, MA 01460.

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SOFTWARE & SERVICES

Continued from page 69

System provides cost accounting that enables hospitals to comply with state and federal reimbursement requirements. It also helps forecast service demand, manage multiple product lines and provide hospital management with information needed for third-party payments.

The Health Care System works with MSA's Expert link micro-mainframe software and with Information Expert, the company's fourth-generation reporting and retrieval tool. MSA Health Care System for Datacom/DB costs between $130,000 and $220,000, depending on modules and options.

MSA, 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

■ Tres Systems, Inc. has added remote on-line printing capabilities to its Materials Management System (MMS) for IBM mainframes running under OS/MVS.

Tres MMS/II Version 1.4.3 now allows multiple shipping notices and information to be accepted for back-ordered items. Other enhancements reportedly allow stock-code items to be cross-referenced to purchase orders, and an account validation facility helps eliminate erroneous entries.

MMS/II Version 1.4.3 costs approximately $200,000 to $225,000, depending on configuration.

Tres Systems, 16775 Addison Road, Dallas, Texas 75248.

■ Intro-Logic, Inc. has announced its Manufacturing III system for order entry, production and inventory control, shop-floor management and shipping and receiving applications. Manufacturing III runs on the IBM System/34, System/36 and 4300 series CPUs under DOS or OS.

A spokesman said Manufacturing III is based on a closed-loop design. The product features an integrated general financial system that ties manufacturing activity to general ledger, accounts payable and receivable and payroll systems. The software is menu-driven and uses English language commands.

Manufacturing III costs $40,000, the vendor said.

Intro-Logic, 24700 Northwestern Highway, Southfield, Mich. 48075.

■ McDonnell Douglas Information Systems Group has added a mechanisms linkage module to its Unigraphics II computer-aided design, engineering and manufacturing software.

The Mechanisms module allows engineers to perform detailed analyses of components such as rods, springs or joints, a spokesman said. The product provides capabilities for multielement linkage design, analysis and animation and interfaces to third-party analysis packages. The Mechanisms module also allows the designer to perform static, kinematic and dynamic analysis.

The Mechanisms module costs $8,000 to $18,000.

McDonnell Douglas Information Systems Group, P.O. Box 516, St. Louis, Mo. 63166.

■ National Information Systems, Inc. has announced that its Vue project management system is now available on Convergent Technologies, Inc.'s Mainframe and Gould, Inc. computers under AT&T's Unix.

A spokesman said Vue uses the critical path method of scheduling and includes capabilities for sorting, specifying a time window and choosing selected materials for reporting and summarizing.

Vue also runs on Convergent Technologies' Megaframe, Digital Equipment Corp.'s VAX series and PDP-11s, IBM mainframes under VM/CMS, Hewlett-Packard Co.'s HP 9000 and Honeywell, Inc.'s DPS-6 and DPS-8 computers.

Vue is priced from $2,995 to $20,000 depending on hardware configuration.

National Information Systems, Suite 150, 20370 Town Center Lane, Cupertino, Calif. 95014.

■ WR Associates Information Systems, Inc. has announced Release 2.1 of its Order Entry Invoicing & Sales Analysis System for IBM System/34 and 36 minicomputers.

A spokesman said enhancements to Release 2.1 include the following features: expanded pricing capabilities allowing pricing by customer and item in addition to user-defined trade discounting; on-line credit checking based on dollars and days past due; open order and invoicing; and gross margin analysis reporting.

Release 2.1 of Order Entry Invoicing & Sales Analysis System is priced at $4,500.

WR Associates Information Systems, Suite 203, 5105 Marshall St., Richmond, Va. 23230.

■ Control Data Corp. has announced that Schadfeld & Associates, Inc.'s Ingot fourth-generation language and decision support system software now runs on Cyber 180 computers under CDC's NOS/VE operating system.

Ingot also runs on IBM mainframes under MVS/TSO and VM/CMS, Data General Corp. machines under DG's AOS/VS, Prime Computer Corp. processors under Primos and Digital Equipment Corp.'s VAX computers under VMS.

Ingot is said to include a standard universal interface to personal computers and word processing systems and a standard operating interface to permit its models to operate with other programs in the computer.

Ingot for CDC systems is priced from $8,000 to $40,000.

CDC, P.O. Box 0, 8100 34th Ave. S., Minneapolis, Minn. 55417.

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SOFTWARE & SERVICES

■ **Advanced Data Systems, Inc.** has announced a customer order information system and a scheduling and inventory control package for Hewlett-Packard Co. HP 3000 computers.

Customer Order Information System (Coins) provides order entry and invoicing, financial management and payroll and personnel functions, a spokesman said. Coins operates as a stand-alone system or can be integrated with the company's inventory control package. Coins is priced at $15,000.

The Scheduling, Purchasing, Inventory Control, Reporting and Engineering (Spire) package is designed to support the job shop, the spokesman said. Spire is a modular package and is priced from $5,000 to $50,000, depending on customization.

Advanced Data Systems, Suite 105, 3604 Galley Road, Colorado Springs, Colo. 80909.

■ **Global Software, Inc.** has introduced an accounts receivable package for IBM mainframes under IBM's OS, DOS/VSE and MVS operating systems.

A spokesman said the accounts receivable system provides users with alternate access paths for inquiry and multilevel security features. Other features reportedly include an online notepad that prompts users with a message and appropriate account history when an account review is accessed, a report writer and secondary key indexing.

The Global Software accounts receivable system is priced between $80,000 and $100,000.

Global Software, 1009 Spring Forest Road, Raleigh, N.C. 27609.

■ **Real Estate Solutions, Inc.** has announced that its revised "Guide to Real Estate and Mortage Banking Software" is now available.

The updated guide, a 1,220-page, two-volume manual, highlights more than 525 available software packages and computer services.

The guide's software analysis features a product description, data on specific business applications, intended users, property types, program structure, operating systems and hardware requirements, documentation and prices, according to Real Estate Solutions.

The guide is available for $136.

Real Estate Solutions, Department R, 3609 Kingle Road N.W., Washington, D.C. 20008.

■ **Command Data Systems, Inc.** has introduced the Computer-Aided Dispatch and Police Records Management integrated software packages and a Crime Analysis module for its Leader records system for use by police and emergency agencies with Digital Equipment Corp. VAX series computers.

The Computer-Aided Dispatch system consists of modules that manage police and emergency vehicles and personnel within a locality. It is said to maintain status reports, prioritize incoming calls for help and assign vehicles to emergency situations. The system automatically logs all status changes.

The Police Records Management System consists of modules that are said to help track known criminals, recognize similar modus operandi, retain field interview data, inventory lost or stolen property and interface with local, state and national crime information systems.

The Crime Analysis System module reportedly allows officers to search for information based on criteria such as physical descriptions, types of crimes, vehicle descriptions and criminal histories. It is said to be useful for detecting crime patterns, forecasting, allocating resources, correlating suspects and organizing special operations.

Prices for the systems vary according to requirements. The Computer-Aided Dispatch system ranges from $50,000 to $95,000 and the Police Records Management System, from $40,000 to $90,000. The Crime Analysis Module costs $16,000.

Command Data Systems, 6330 Village Pkwy., Dublin, Calif. 94568.

■ **McDonnell Douglas Computer Systems Co.** has announced an agreement to market Computer Programming, Inc.'s Serialized Inventory Tracking and Control System (Sitacs) for McDonnell Douglas' Microdata Corp. 4000, 6000, 9100 and 9200 processors.

A spokesman said the Sitacs inventory management tool allows the tracking, control and movement of inventory by location and status and tracking of raw material and sub-assemblies. Modules in Sitacs include requisition and field issues and returns, inventory and purchase order control and repair order processing.

An optional subsystem, Military Standard for Requisitions and Purchases (Milstrip), is also available. Milstrip creates issues and returns from a Department of Defense 80-col. record format.

Sitacs' applications software is priced from $25,000 to $35,000 for a permanent license. The Milstrip option is priced at $5,000.

McDonnell Douglas Computer Systems, 17481 Red Hill Ave., Irvine, Calif. 92714.

■ **Greene Software** has announced ESS/36, an Extended Magica Security system for IBM System/36 Magica users.

A spokesman said ESS/36 allows each Magica menu option to be secured individually for control of program access. New Magica menus, menu options or applications may be added and secured at any time. ESS/36, transparent to users, can be used in addition to Magica-level security or as a stand-alone security system.

Continued on page 72

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SOFTWARE & SERVICES

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The menu-driven EMS/36 has Help screens and password reports and is written in RPG-II.

EMS/36 costs $395 for a one-time license fee.

Greene Software, P.O. Box 23, Victor, N.Y. 14564.

■ **Data Systems for Industry has unveiled a purchasing module for its QED manufacturing management system on the Hewlett-Packard Co. HP 3000 and Stratus Computer, Inc. Stratus/32 systems.**

The Procurement Requirements Processing (PRP) module maintains the on-order status of items purchased for materials requirements planning (MRP) and receiving. It produces printed purchase orders automatically from the MRP file and permits manual entry of purchase orders, a spokesman said.

The product offers automatic vendor sourcing and provides vendor performance and purchase price variance controls.

The PRP module costs $15,000.

Data Systems for Industry, 3942 Cerritos Ave., Los Alamitos, Calif. 90720.

■ **Dimension 4 Design Group has announced an accounts collection package for users of IBM's System/34 and 36 minicomputers.**

The Money Collection System automatically prints customized collection letters and tracks collection activity until an account is paid, a vendor spokesman said. The product organizes collection efforts and alerts users when accounts are entering past-due status. It also interfaces with IBM's Mapics and other IBM accounting packages.

The Money Collection System costs $1,250.

Dimension 4 Design Group, Worthington, Ohio 43085.

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Each member of the Quadnet family of local area network systems has its own unique characteristics. Yet all four share one family trait. The same network software.

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■ **Vector Automation, Inc. has announced an International Graphics Exchange Standard (Iges) format converter for its Cadmax family of computer-aided design and manufacturing products.**

The Iges Format Converter converts existing drawing files into a standard Iges format for transfer from compatible CAD/CAM systems into the Cadmax products, the vendor said.

Drawing files can be output to a 9-track 800 or 1,600 bit/in. tape. The product costs $5,000.

Vector Automation, Village of Cross Keys, Baltimore, Md. 21210.

■ **Versatec, Inc. has introduced Versaplot 9, a plot generator for Versatec's monochrome or color electrostatic plotters running under Digital Equipment Corp.'s VMS operating system.**

According to a spokesman, Versaplot 9 supports Direct Memory Access data transfers to Versatec's DMA controller for immediate on-line plotting. Output can be targeted to disk, magnetic tape, or directly to the Versatec plotter.

The product is available in Fortran IV and DEC's VAX-11 macro assembly language source code. A set of command files is included.

Versaplot 9 is available on diskette or 9-track magnetic tape for $4,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

■ **Computronics has introduced a system usage accounting package for users of Prime Computer, Inc.'s Primos Revision 19 operating system.**

A vendor spokesman said Log-Time keeps information about the system user for calculation of computer charges. Log-Time will compute charges for connect time, CPU time and disk I/O time. Charges are logged to the disk and can be used in the production of invoices and charge-back reports, the spokesman said.

An audit trail registers unsuccessful attempts to log on to the system, the spokesman said. In addition, Log-Time includes an interuser electronic mail subsystem. Price for a single system is $600.

Computronics, 4N165 Wood Dale Road, Addison, Ill. 60101.

■ **Calma Co. has announced Geodraw, a two-dimensional computer-aided engineering drawing tool that allows a design engineer to create drawings from a solid model design. Geodraw runs on Calma's Digital Equipment Corp. VAX-based system or**

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SOFTWARE & SERVICES

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Calma's Apollo Computer, Inc. workstation-based system.

Geodraw was developed by Structural Dynamics Research Corp. (SDRC). A vendor spokesman said Geodraw interfaces with SDRC's Geomod solids modeling package to provide a method for producing 2-D documentation of conceptual models for project analysis, prototyping and contract bid requisitions.

Using Geodraw, users can create text, dimensions, labels and balloons and interact with the system to arrange arrows and position text. Other features include limit dimensions, curve fonts and the ability to create symbol libraries.

Geodraw on a DEC VAX costs $25,000; on an Apollo workstation, $12,500.

Calma, 901 Sycamore Drive, Milpitas, Calif. 95035.

■ Lilly Consulting and System Services has announced a three-part access security system for users of the Digital Equipment Corp. RSTS/E time-sharing system Version 7.2 and greater.

According to a vendor spokesman, the SAC System controls day and time of day access by user account, keyboard number and keyboard type. SAC System reportedly can limit the system commands a user can issue and programs a user can run.

SAC Menu provides menu access control for hard-copy and CRT terminals with a choice of 16 access privilege levels. SAC Password reportedly offers password protection and generation.

The bundled system costs $2,000. Unbundled prices are $1,400 for SAC System, $1,200 for SAC Menu and $450 for SAC Password.

Lilly Consulting and System Services, 7259 W. Marine Drive, Milwaukee, Wis. 53222.

■ Viking Software Services, Inc. has announced software for Digital Equipment Corp. VAX computers that allows users to select and execute tasks without using the operating system command language.

The Viking Control System (VCS) was designed for users of limited computer functions, a vendor spokesman said. The program assigns each user an access and privilege profile to maintain system control and security. A Control Program requests the user's identity and password, validates the user and presents a menu of tasks from which the user may select.

The VCS also includes a reporting program and an access control mechanism. Viking's Form Manager and Data Manager are required for use. The VCS costs $1,000.

Viking Software Services, Suite 816, 2515 E. Skelly Drive, Tulsa, Okla. 74105.

■ Software Express, Inc. has announced that its Appgen applications generator now runs on Digital Equipment Corp. AT&T Unix-based VAX computers.

Appgen reportedly allows the developer to create and customize an application through a series of English-language prompts. The prompts drive the general applications processors that provide the business applications functions. A developer's responses build parameters to drive the runtime module and create a specific application, a vendor spokesman said.

The price of Appgen on Unix-based VAX systems ranges from $6,000 to $24,000.

Software Express, 2925 Briarpark Drive, Houston, Texas 77042.

■ Precision Visuals, Inc. has announced that its line of graphics software now runs on all Perkin-Elmer Corp. computer systems.

Software available for PE computers includes Precision Visuals' DI-3000 graphics tools package, Grafmaker for defining charts and graphs, the Metafile System and the Contouring System for generating contour plots, according to a vendor spokesman.

The Precision Visuals packages, available from PE, cost from $500 to $14,000, depending on configuration.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

PE, 2 Crescent Place, Oceanport, N.J. 07757.

■ Precision Visuals, Inc. has announced that its DI-3000 graphics tools package now runs on Apollo Computer, Inc's. DN300 and monochrome DN600 workstations.

According to the vendor, DI-3000 allows graphics programmers to access capabilities of pen plotters, film records and other output devices without modifying the applications.

DI-3000 reportedly supports Apollo's windowing system by putting each application program in a different window and treats each window as a different graphics output device.

DI-3000 licenses for the Apollo DN300 or DN600 workstations begin at $5,500.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

■ Britz Publishing, Inc. has announced the Graphics/Presentation System for IBM System/34 and 36 minicomputers.

According to a vendor spokesman, Graphics/Presentation is a menu-driven system for analyzing, sorting and presenting graphs or displays.

The product reportedly enables users to create, edit, save and print graphics, including vertical and horizontal bar and scatter graphs.

Graphics/Presentation costs $99.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201.

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BEIZER from page 57

They are not testing adequately or not testing smart. In many cases, people spend an enormous amount of money on testing. But because they don't understand testing needs and they don't understand the technology of testing, they are basically wasting their money.

Q *What do you mean by not testing smart?*

If you throw a million random numbers at a routine, that could be an enormous number of tests. But that doesn't mean that those tests prove anything. Testing smart is using a variety of techniques, using structural and functional techniques. There's a whole [testing] technology out there, and people don't know about it. So testing smart is using effective tests — tests that have a high probability of revealing bugs.

Q *How have attitudes toward testing changed? Are companies starting to recognize the importance of testing?*

I would say that those [companies] that have been burned very badly or those that are very advanced in their thinking are coming around to that point of view. But the prevailing attitude today is still that it is all right to test only 50% of the code. These companies are thinking only of short-term goals and not accounting for the [long-term] cost of bugs.

Q *What contributes a realistic attitude toward testing?*

Understanding the issues of testing and quality assurance, having basic knowledge of the techniques and establishing the management and technical resources required.

Q *Is there such a thing as a foolproof test of software quality?*

Not for any real programs. The ultimate test is pragmatic. I can argue that a program has no bugs because I don't care how it behaves. The idea of what is and isn't a bug is essentially a human judgment.

All bugs stem from human misconception or disagreement. Consequently, there can be no theoretical proof or no formal method that guarantees the elimination of bugs.

Q *Do a variety of programming languages affect testing procedures?*

Certain types of programming languages can reduce certain types of bugs. Assembly language tends to be the most bug prone. More modern languages like Pascal eliminate certain types of bugs or make them unlikely to occur. However, because programs in the higher order languages tend to take on more complex tasks, the bug rate has remained almost constant. We're finding a raw bug rate before testing on the order of 5%, or three bugs per 100 statements. It doesn't seem to matter whether there are 100 assembler-level statements or 100 statements of Job Control Language or 100 statements of Pascal or Cobol.

Q *What portions of the program are the most important to test?*

All of it. Bugs are random. Bugs are wild cards. The bug doesn't know which part of the program you are emphasizing.

Q *What percentage of a product life cycle should be spent on testing?*

You can't test forever; otherwise, the product never leaves the house. So you've got to say, "I can afford to do this amount of testing, and I'm going to allocate my resources in the optimum way."

If you look at the limited view of testing from conception to the point at which it goes out the door, nobody in this business today could argue for anything less than 50%. Everybody agrees it's at least 50% testing, 50% development until the product is released.

> ***Quality is where it's at. And we are going to learn how to build testable designs. Structured coding was the big subject of the '70s. In the '80s it's testable designs.***

Q *What can be done to convince upper management that testing is critical?*

Two things. In some cases, they've had a very serious catastrophe that has almost ruined them. If they've had a catastrophe and it's recoverable, then sometimes management's head is turned around. Fundamentally, though, it has to be a grass roots movement. Programmers have to start testing with or without management support and show tangible evidence [of improvement] in terms of producing products at lower costs with longer life spans and that are easier to maintain.

Q *Do you see that happening?*

I see it happening in some places. I think there's nothing less than a revolution going on. I think the computer world is going to polarize into those who understand quality and those who don't.

Q *What can DP management do to foster the proper attitude toward testing?*

First, [managers] better get realistic attitudes about what software development is all about. Secondly,

See SUBMIT page 76

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they've got to stop laying guilt on [programmers] for the existence of bugs, which they do. Human beings are being asked to produce perfection for which they are not equipped. Consequently, we have to stress prevention methods and test methods that catch bugs.

Also, who is management rewarding? Management rewards the programmer who fixes the bug. Well, that's the [person] who put it in. Every [quality assurance] person I have talked to said we're punishing the people who discover the bugs, and rewarding the people who put them in. That's a very mixed message.

Q ***To whom should the responsibility of testing fall? Should there be specific people assigned to do just testing or should this testing be rotated?***

It should be a responsibility divided among programmers. But it depends a lot on the product and its complexity.

I advocate a balance between the designer's own test and independent testing depending on where in the phase of things you are and where in the life cycle you are.

Q ***What about the future of software testing — where do you see things going?***

I see the future of software as an activity dominated by testing with occasional forays into design. As far as I'm concerned, quality is where it's at.

And we are going to learn how to build testable designs. Structured coding was the big subject of the '70s. In the '80s it's testable designs.

IBM from page 57

well be inclined to view the glass as half empty. Despite the fact that recent market research indicates IBM's two premier DBMS — IMS and DL/1 — account for close to two-thirds of the installed DBMS base, the blue giant is losing its once viselike grip on the DBMS market.

Glass more than half full

Considering the revenue IBM derives from its DBMS products, others might see the glass as something more than half full. According to the Gartner Group's Smith, IBM's DBMS-related products garnered the Armonk, N.Y., goliath well over $600 million — out of total software revenue of about $3.2 billion — in 1984.

Six hundred million dollars is an amazing figure when you contemplate the *total* revenue of the independent software companies considered to be leaders of the pack. When one of the independents breaks the $200 million total revenue mark some time in the future, it will be earning only one-third of what IBM earned from DBMS software alone last year.

By the time the $200 million milestone is reached, however, it will represent less than a third of IBM's DBMS revenue for the same period. Gartner Group predicted approximately 30% compound growth in IBM DBMS revenue, a growth rate that should bring DBMS revenue to much more than $2 billion by the end of this decade.

Glass half empty

Still, as far as revenue-conscious IBM is concerned, trends in the DBMS market make the glass seem half empty. Like applications software, DBMS software is becoming a chink in IBM's revenue armor. Gartner's research shows that an increasingly smaller number of prospective buyers are looking to IBM for their DBMS. That trend was borne out by International Data Corp. (IDC), which, in a recent ly, study, predicted that by 1988 just under half of DBMS sales will go to the independents. In addition, Gartner's research indicates that users view IBM's DBMS products as weak in most functional areas.

> ***Even though IBM's two premier DBMS account for close to two-thirds of the installed DBMS base, the blue giant is losing its once viselike grip on the DBMS market.***

What's the problem? As most large users are probably painfully aware, IBM's IMS and DL/1 are aging technology — albeit technology that has lived a long and extremely useful life. Yet, the weight of a large percentage of the world's applications rests on those systems.

So, while a productivity-hungry marketplace has turned to the vendors of such tools as relational DBMS, fourth-generation languages and powerful applications development systems, IBM has had to face the dilemma of providing the new wrinkles its customers need while maintaining the older systems on which their clients' operations are based. A massive installed product base that assures a steady stream of rental income is a wonderful thing. But, as Atlas knew, the weight of the world can be ponderous.

IBM's DBMS strategy to date has not won rave reviews from users or critics, although time may soften some of the criticisms that have risen. IBM's approach is essentially a dual-DBMS one, which focuses on IMS for production systems and the fledgling DB2 relational DBMS for information center or end-user needs. Two DBMS with two leases without a great simultaneous increase in productivity, users and ob-

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servers said, is a little hard to swallow.

"IBM is shooting itself in the foot with the dual-DBMS strategy," Smith explained, "and will continue to slip here."

Existing base hard to penetrate

Thus, the independents have been able to move swiftly in the DBMS market — at least as far as new customers are concerned.

But a harder market to penetrate has been the existing IBM DBMS user base. Applied Data Research, Inc. is betting, though, that its recently unveiled DL/I Transparency will help it get both feet into that base in short order.

The DL/I Transparency is said to allow IMS and DL/I users to migrate to ADR's Datacom/DB relational DBMS without a massive conversion, a stumbling block any user would pale before in moving to another DBMS.

At the introduction of DL/I Transparency, ADR President Martin Goetz said, "DB2 is only a partial solution. IBM is locked into IMS, and DB2 is not satisfying users."

Timing may be off

But ADR's timing may have been off, at least in the eyes of some users and analysts. While IBM's dual-DBMS strategy has been less than satisfying, there has been grudging acknowledgement that IBM is moving to improve the capabilities of DB2 and may even eventually position it as its primary DBMS offering. Users may not be as unhappy with the migration path IBM has carved out as some would believe.

One large prejudice that will have to be overcome, and one that ADR firmly believes it can overcome, is the notion that relational systems are not appropriate for production applications.

But it may take some convincing to sell IBM shops on the idea that they should stray from the path of Big Blue and place all their eggs in a relational basket — especially if there is a chance IBM will get its DBMS house in order.

But if IBM does that, then things will be different all over for the independent DBMS vendors. For now, though, ADR sees the market as a glass half full.

DBMS from page 57

ble than traditional hierarchical or network systems. But exercising relational flexibility requires unstructured processing. If a relational system imposed the discipline required of structuring processing to achieve good performance, then its flexibility would be lost. Systems are either flexible or they perform well; they do not do both.

Performance problems

Ironically, at the physical data structuring level, relational and hierarchical systems can be configured almost identically. It is not at the physical data structure level that relational systems are unable to perform. It is in the unstructured use of the relational systems that performance problems arise.

At first glance, there seems to be a conflict between business function and the standard work unit. But that conflict disappears upon detailed examination.

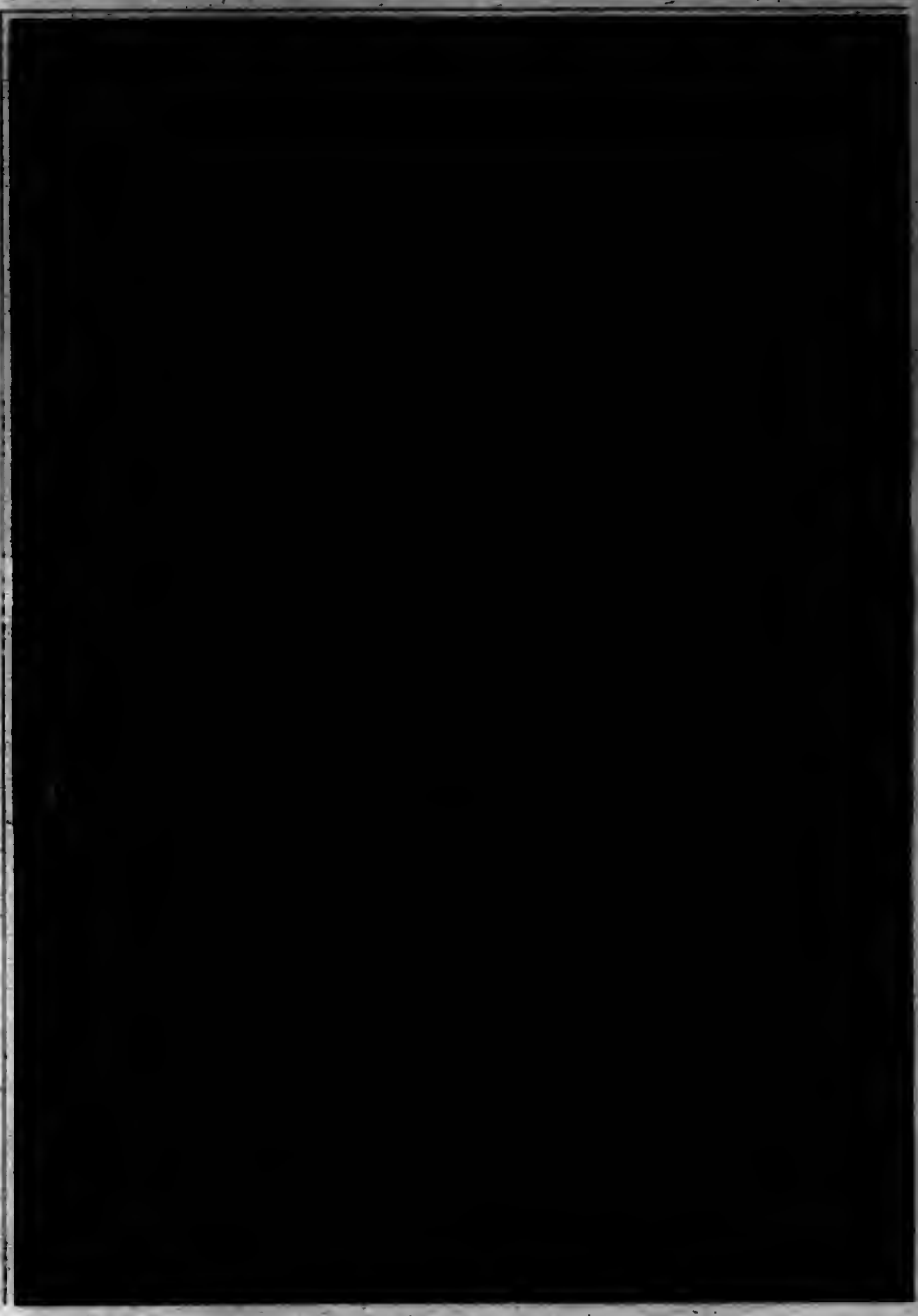
Consider the amount of business function that an airline clerk has. The clerk can book trips, assign seats, take payment, reserve accommodations, assign ticket class, determine discount, order special meals, reserve automobiles and so on. In short, airline clerks have a tremendous amount of function at their fingertips.

And what sort of response time does the clerk experience? Consistently good response time. The secret is in the on-line packaging of the airline function. Consider how the clerk accomplishes function. The clerk transacts one piece of the function at a time — not all at once. It may take 10 different transactions to book a trip, but each enjoys a response time of one to two seconds.

What the clerk does not do is load all the information at once, push the Enter key and hope everything works out well — and quickly.

Consider the on-line packaging of business function in another environment — the insurance industry. One approach to building life insurance policies is to cram a large amount of information into several screens and then push the Enter key to

See DBMS page 78



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transact the policy. Such an approach is the result of transferring a batch mentality to the on-line environment.

Using the standard work unit, the same function could be accomplished. First, the policy number is created in the data base by an on-line transaction. The next transaction attaches name, address and so on to the policy. The next transactions address beneficiary and employment information and so forth.

Instead of one giant transaction, many smaller transactions are run. Each transaction uses less I/O and achieves a response time of two to three seconds. There is no difference in the function, but rather in how the function is packaged. And packaging the function in accordance with the standard work unit is the secret to satisfactory on-line performance.

Application throughout design process

The standard work unit, to be effective, must be applied throughout the design process. If the standard work unit is first mentioned at the program debugging phase, then it is often too late to reconstruct a transaction that grossly violates the standard work unit. So, effectively applying the standard work unit requires that the designer be aware of proper packaging of on-line functions early in the design process.

In the early stages of design, the developer hardly knows a great deal about specific I/O activities. However, the developer does know about data-driven and multifunction processes.

A data-driven process is one in which resource consumption depends on the amount and/or the configuration of the data on which the process operates. A multifunction process is one that attempts to do a great deal of processing in a single execution, much like the large batch programs that did everything on a master file once the batch program had control of the master file.

The developer can look for both data-driven and multifunction processes early in the design life cycle and design accordingly. If the designer does a good job early on, the result is a minimum of fuss once the system gets to the point of being programmed.

Work unit simplifies relationships

One very beneficial by-product of the standard work unit is strictly nontechnical. When installed and adhered to, the standard work unit greatly solidifies the relationship between applications developers and the data base administration group — normally a stormy relationship. Applications designers know very specifically the parameters under which their on-line transactions must be built.

Provided the applications group adheres to these standards, it has the final say on how the system is to be built. And the data base administration group knows that if all applications are built under the standard work unit, performance will be satisfactory.

The standard work unit must be addressed technically and organizationally. The latter is because to be effective, it must be applied across the entire organization. Further complicating matters is the issue of complacency. When first applied, the standard work unit requires change. Those changes are reflected in the work patterns of the designer and the programmer — two groups that traditionally resist change.

> ❞
>
> *If a relational system imposed the discipline required of structuring processing to achieve good performance, then its flexibility would be lost.*

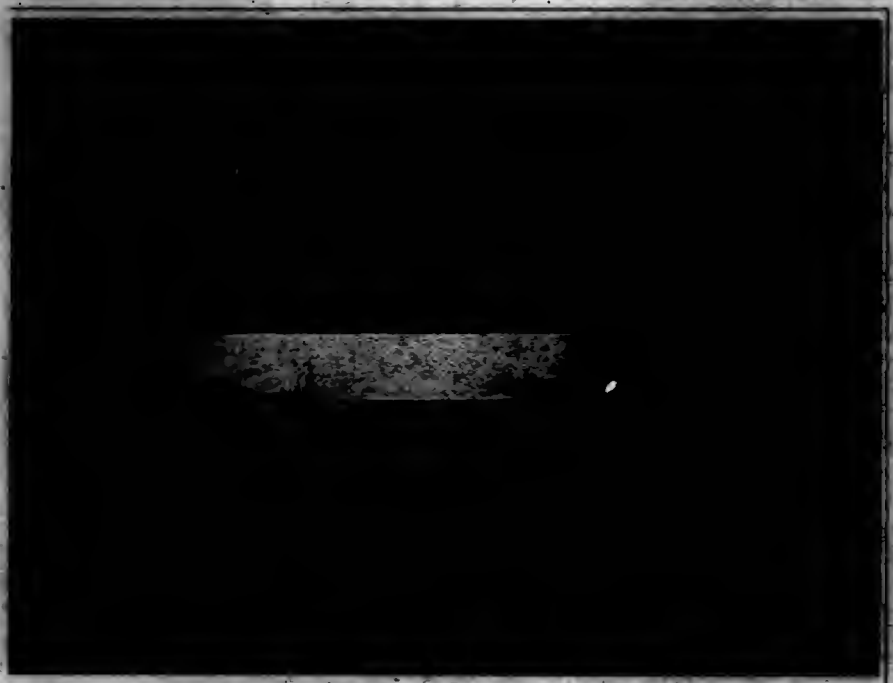
Stick and carrot approach

Management must embrace the standard work unit with both the stick and the carrot. It must understand that not embracing it leads to poor on-line performance, which in turn leads to the unnecessary acquisition of more hardware. There is a strong, direct relationship between the standard work unit and budget control.

The standard work unit positively affects the DP budget in another important way. On-line systems written under the standard work unit only have to be maintained when there is a change in the users' requirements. But on-line systems not written under the standard work unit require constant modification just to achieve adequate response time. Thus, the standard work unit directly affects the maintenance as well as the hardware budget.

The standard work unit is the key to on-line performance. It dictates that each on-line transaction do a discrete amount of processing — usually controlling the amount of I/O performed by each transaction. The standard work unit can be formulated in terms understood by the programmer — in terms of data base calls or points based on data base calls. Management must be aware of the positive budgetary impact that can result from establishing and enforcing the standard work unit.

Inmon, a director at Coopers & Lybrand in Denver, is a noted author on the subject of data base design and a regular contributor to Software.



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That's because IBM doesn't have local area networking yet. And who knows when they will.

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IN DEPTH

CHIEF INFORMATION OFFICER

Does your company need one?

By Michael Weiner and John Girvin

The information revolution is going to sort out MIS executives into winners and losers. At risk is your position on the organization totem pole. There is opportunity to be up with the thunderbird or down in the dust.

The importance of the information asset is taking concrete form in a growing number of companies with the emergence of an enterprise-level resource manager called the chief information officer, or CIO.

First, a definition: "Chief information officer" is a generic title for an enterprise-level executive (usually a senior vice-president) who participates on a peer basis with other corporate officers in the formulation of company policies needed for the direction, management and control of the business. The CIO's participation is not limited to information, but rather, encompasses all aspects of the business where information plays a key role. He is the information

IN DEPTH

Interviews

By George Harrar
Senior Editor, Features

For years the CIO position has been more idea than reality, a dotted box sketched onto a corporation's management hierarchy with no name to fill it. The true CIO is still difficult to find.

Here are three — from a bank, an insurance company and a maker of machinery and chemicals.

William SYNNOTT

Page 8

"Someone who comes to the job with a knowledge of business and picks up technology along the way has an edge in becoming the CIO."

David HASKIN

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"[The CIO] takes the MIS function and uses it to its full capability in providing information and knowledge to operating policy members."

Dan IRWIN

Page 22

"We recognized a wave of technology coming. If we continued our old pattern organizationally, we were likely to miss opportunities."

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resource representative and technology adviser to the chief executive officer and other members of the executive committee.

For the DP executive seeing the creation of this new position, several important questions present themselves:

- What are the most appropriate functions of a CIO and what is his value to the organization?
- What could a CIO accomplish that an MIS executive could not?
- Will the CIO concept work in your organization?
- If a CIO becomes a reality for your company, how will it happen and what is your role?
- Can you (should you) be that person?
- What is critical for the success of a CIO?
- What makes this concept attractive to business management?
- Is this position a natural career path for the DP executive?

To John Diebold & Associates, the concept of the CIO seems well matched to the needs of organizations that seek to use information as a managed resource and its technology as a means of extending the reach of what they know and do.

Our recent research, including interviews at major corporations, gives us a picture of the CIO — who he is, what he does, how he got where he is and the factors crucial to his success.

Reporting relationship

The first thing to note about the CIO is his position in the organization. Tradition has long placed the information systems function under the chief financial officer, a placement that made sense because most early systems supported accounting and financial functions.

The CIO has now moved away from this reporting relationship and usually reports directly to the chief executive officer or similar corporate general manager. This change is important. The elevation itself is central to the concept, and the new reporting relationship underscores that the CIO now has a companywide responsibility and orientation.

Most CIOs have been created by direct action of the office of the president or the chairman of the company. The chairman of a large Western bank holding company, for example, directly recruited the senior DP executive of another bank to be his personal technology adviser and information policymaker.

The chairman has almost completed an extensive decentralization of the corporation into line-of-business units, making the heads of those units responsible for the management and use of technology. The CIO supplies the coordinating element in this organizational approach.

There are several messages here: The demonstrated interest of executive management has much to do with providing visibility and authority to the CIO. It seems the CIO requires top-down, rather than bottom-up, initiation. The idea can originate in the systems department, but it must be made attractive to the executive office or it probably won't fly.

The MIS director of a major energy company felt that the distributed nature of the firm called for a CIO position as a technology facilitator and coordinator. He initiated a study that recommended the concept to the president.

The MIS director saw himself in this new role. The company saw things differently. The job went to a "spare" executive who was between assignments. The MIS director continues to support the concept and the incumbent but questions his own sense of strategy.

Is the senior MIS executive the natural candidate for the CIO job?

Not necessarily. Of the CIOs interviewed, less than half have spent their careers in data processing. Most do have a good technical background, but they are most interested in what works rather than how it works.

Many CEOs seek a CIO who can make them feel confident that the technology is being managed properly without bombarding them with DP

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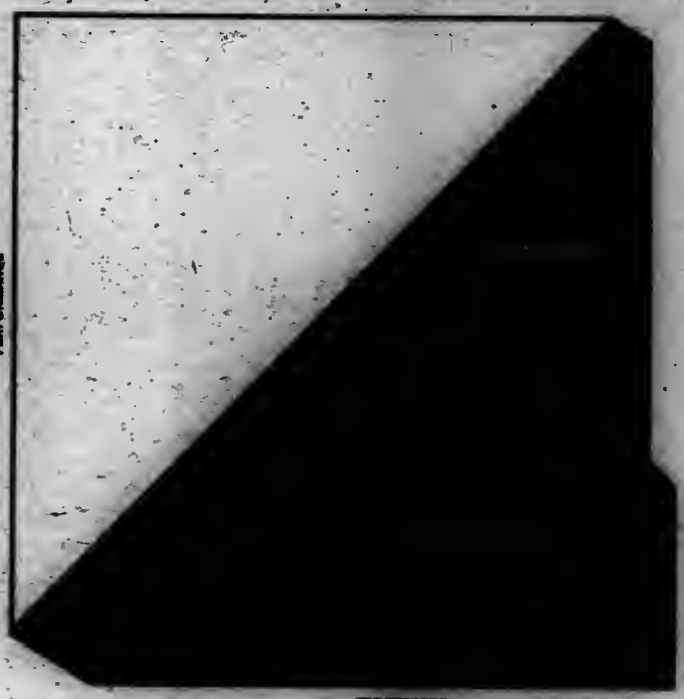

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> ***The CIO is a staff function with no direct responsibility for line activity. CIOs are rewarded handsomely — salaries in the range of $150,000 to $250,000.***

buzzwords. It is most important that the CIO have a good knowledge of business in general and his company's industry in particular. Detailed technical workups should be the function of his staff.

Should the CIO and the senior MIS executive be one and the same person?

In most cases, no. The CIO seems to function best when separated from the day-to-day responsibilities for systems and operations activities. Where this setup may not be organizationally feasible, the existence of strong lieutenants can insulate the CIO from the tactical aspects of information processing. One CIO interviewed (in the insurance business) preserves the distance between himself and DP development and operations. "I don't want to waste time in executive-level meetings explaining why the system went down during the closing or why a project is lagging — although I want to know about it," he said.

In what sort of organization will the CIO concept find the most fertile ground?

Our recent surveys point to the decentralized model as the type of organization where a CIO can play a particularly full role. The need to coordinate activities, especially at a planning level, recurs in corporations with distributed resources.

Most CIOs actively participate in the information systems planning function. While not necessarily the final arbiter of the plans, the CIO has a controlling influence over the shape and coordination of the plans through his policy functions. In addition, organizations with CIOs have made impressive steps toward the coordination of information and business planning.

True believer

The CIO is unique. Perhaps you can see yourself in this description: The typical CIO is a person who commands respect within the general corporation. He holds a track record of managerial accomplishment and has acknowledged command of the workings of his business. He is a true believer in the importance of information and information technology and is considered a dependable adviser on its uses. The CIO of our acquaintance is an effective manager who has the proven ability to get work done through people.

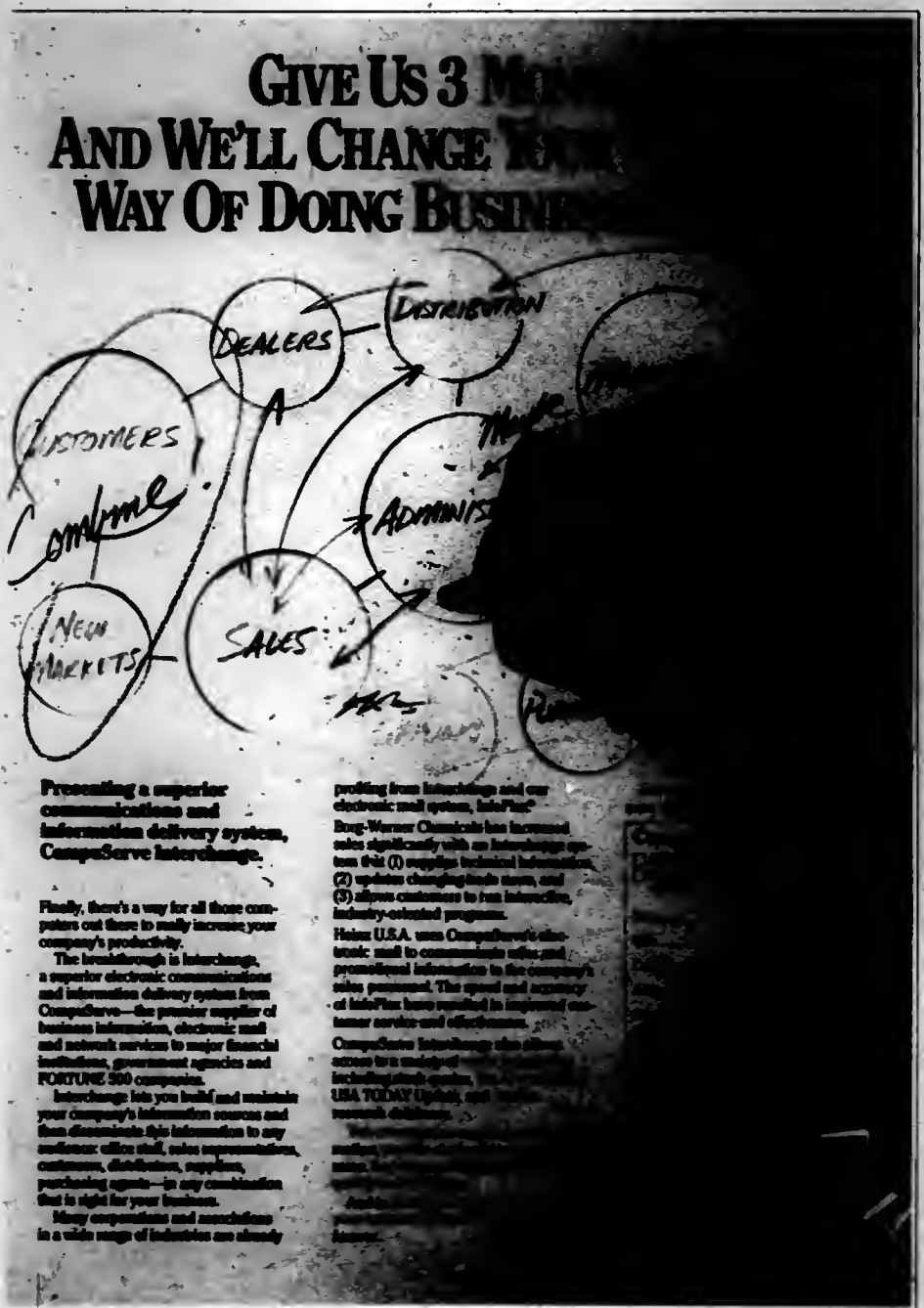
Above all, this CIO is a communicator who can express and sell ideas — to the CEO, to his peer group, to his subordinates. This ability to communicate is indispensable in his role as adviser and coordinator. The CIO, in contrast to the MIS executive, gets things done by negotiation rather than command.

The CIOs interviewed described their jobs as important, interesting, different and difficult.

"I spent my entire career telling people what to do," said the CIO of a Midwestern insurance company. "Now I have to ask for cooperation — sometimes even plead!" Another remarked, "The dotted-line relationship is easy to draw on an organization chart but has an intentionally vague definition — people can find a way to ignore you."

The CIO is a staff function with no direct responsibility for line activity. For their work, CIOs are rewarded handsomely — salaries in the range of $150,000 to $250,000.

Some chief information officers owe their existence to executive fiat. Others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Company	Industry	CIO Title	Reports to:	Time in job (years)	Key functions managed
B	Oil/energy	Vice-president of information technology and corporate services	Executive vice-president and vice-chairman	2	DP, communications, strategic planning
D	Consumer product	Corporate vice-president of MIS	Group vice-president	2	DP, office automation, communications
F	Computer manufacturing	Corporate manager of information systems	Executive vice-president of operations	1	Planning, data management, communications, architectures
H	Insurance	Executive vice-president	President	3	DP, office automation, communications
J	Manufacturing	Corporate vice-president of MIS	President	8	Corporate DP utility, communications, corporate MIS planning
L	Insurance	Division vice-president, technical and operational services	President and CEO	5	DP, office automation, communications, general operations
N	Financial services	Chief information systems officer	Chief administrative officer	1	DP planning and coordination, capital expenditure (DP), policy

Company	Control of information resource (direct or through subordinate)	Technology deployment	CIO background	Degree of success
B	Direct for planning, through DP manager for other	Distributed	General management	Moderate to high
D	Direct	Centralized	Data processing	Moderate
F	Direct	Decentralized	General management	High
H	Through vice-president of MIS	Distributed	General management	Moderate to high
J	Direct	Distributed	Data processing	High
L	Through vice-presidents	Centralized	Data processing	Moderate to high
N	Direct	Distributed	Data processing	Too early to tell

found that their current slot in an organization took on the functions of the CIO naturally (particularly in banking operations).

Whichever the case, the concept itself seems to need to evolve within an organization. This evolution develops over stages:

- The corporate realization that information is a resource and needs to be managed.
- The understanding that the resource needs an executive-level representative.
- Finding the right individual for the job.
- Establishing, by policy, the initial scope and intent of the CIO.
- Gaining the tolerance (and later, respect) of management peers.
- Gaining the first visible success (getting someone to believe).
- Reviewing progress and building on success.
- Reengineering the job to capitalize on what has worked and then fine-tuning the concept to complement the organization and corporate culture.

The chief information officer is not only an appropriate executive position for the future, the job is here now — and it is working. The CIO represents the repositioning of the information function to its true place in the organization.

The CIO offers information systems executives a management position to which they can aspire. But it requires a new viewpoint — one that will not be familiar to many. This job is not for the DP manager who is still the classic computer jock, the machine room honcho, the software closet-type. The CIO will know technology, but he must know business. The CIO can talk to technicians, but he must talk to executives. The CIO can give orders, but he must know how to give advice.

The figure above illustrates the range of CIO implementations in some 15 large corporations, each with more than $5 million in revenues. Most of the companies are effectively decentralized and lie in the financial services sector. Almost all CIOs report to the CEO or equivalent.

The CIO's control usually embraces all information services — data processing, office automation and telecommunications. Most of these executives come from a technical DP background, although always with a strong industry knowledge and management history.

For most organizations, the designation of a chief information officer represents a dramatic change from the status quo. Information must be perceived as a company resource in the same light as capital, people and equipment. This understanding of the value of information in marketing and business management makes it a major concern of executive management.

The handwriting on the wall now says that business will use information technology as a competitive weapon. The chief information officer is an obvious manifestation of the desire to control the resource.

About the authors

Michael Weiner is vice-president of John Diebold & Associates, the division of The Diebold Group, Inc. that helps clients adapt computer and communications technology to improve business effectiveness.

John Glovin, who specializes in organizational studies and strategic planning for information systems, is a senior associate at John Diebold & Associates.

Interview: Synnott

(William Synnott is senior vice-president of The First National Bank of Boston.)

When did you become a chief information officer?

Synnott: I don't know that anybody ever becomes one. It's just an evolution into a new role and responsibility in the firm.

There was no one point of change?

Synnott: No, it's just an acceptance and understanding of the fact that DP is changing from the old back-shop, centralized data center operation to distributed minicomputers and now telecoms all over the corporation. As that occurs, and you have to rise to a new type of leadership to get integration of those resources, the role begins to evolve.

So the chief information officer concept really goes along with information resource management. That is, if you're going to have resources spread all over the corporation, somebody is going to have responsibility for coordinating and integrating those resources through some form of technology architecture and planning. Then you're evolving into a CIO-type role. There are a lot of people around actually beginning to perform that role, whether or not they use CIO as a title.

I don't know of anyone using that title.

Synnott: Nobody uses it as a formal title. It's just like the CFO — nobody uses that as a formal title either. You're usually a controller or financial vice-president or something like that. But they're generally known as the chief financial officer by virtue of the fact that they have control over the financial activities of the corporation. So in the same way, a CIO should have some kind of control and involvement in information resources around the corporation. That doesn't mean he has to own them. It only means he has to have some functional involvement in planning their architecture, their integration.

In your book in 1981 with William Gruber, *Information Resource Management*, you talked about information managers creating this position and the awareness of the necessity of this position. How did you create the position here?

Synnott: Well, let's put it this way: The position became clearer when you have a decentralized operation. When you are highly centralized, it's less clear because you have control of the resources. As the [operation] begins to decentralize, you lose physical control of the resources, and therefore, you have to take functional control. That's when a CIO becomes much more apparent.

In Diebold's recent survey, in fact, it found that there are more CIOs, if you will, in companies that are decentralized than there are in centralized companies for that reason. However, even if you centralize, the very fact that micros and minis are spreading all over the corporation means that the information resource, at least, are decentralized. So one way or another, it's that realization that creates the need for information resource management and the CIO.

Now also, it depends on the kind of company you're in. Companies that use data processing and systems more as a support tool, such as some manufacturing companies, do not view information resources as critical to the corporation. Therefore, there is less likelihood that there would ever be a CIO, let alone information resource management, in such a company. It is more likely that in those companies, the CIO is going to be reporting to someone two or three levels down in the organization. He's not strategic to the enterprise.

On the other hand, in a company where systems are strategic, such as in banks and insurance companies or financial services, it is much more likely that the information resource will be viewed by top management as critical to the enterprise, as a potential for competitive advantage, not just back-office productivity.

So where you have companies that are strategic, where information is vital and where decentralization is occurring, that's where the CIO is most prominent.

To whom do you report now?

Synnott: I report to the president.

For how long have you reported to him?

Synnott: I've reported to the Office of the Chairman for the last five or six years. The Office of the Chairman used to be composed of the chairman, the president and two vice-chairmen. I reported at the time to a vice-chairman. I later began to report to the other vice-chairman, who subsequently became president. So I've sort of been in that Office of the Chairman for the last five or six years.

Also, over the last three years, we have had a major strategic planning exercise in the bank, which resulted in the restructuring of the entire bank by product lines, by customer segmentation and so on.

In that process, it was determined that we would try to decentralize the staff functions to the five groups that comprise the bank. And so, not just systems but also human resources, finance and all of the other staff functions began to be decentralized.

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which I head up, which is working for the Office of the Chairman and represents the Office of the Chairman in coordinating the activities of the five groups.

That's where you see the opportunity for the CIO?

Synnott: That's where the CIO becomes much more prominent because the need is much more prominent. When you have a completely centralized operation, where you have control of all the technology resources, there's less need for a CIO as such, because you already have all of the resources. The architecture is in place, and you are making decisions on it every day. But when the resources get decentralized, and you don't have control over all of them, that's when you need a technology architecture that controls the infrastructure. That's when you need policies and standards, and that's when you need strategic planning. The whole role of the CIO, which represents that kind of thing, becomes much more obvious.

That's not to say that people who are centralized don't have CIOs or the need for them. But it's simply that the need is different, according to the type of company and how centralized or decentralized you are.

You're talking very broadly in terms of policy, setting guidelines and architectures. Give me an example of what kind of decision would be made by you and what kind might be made by someone who reports to you, in terms of the technology.

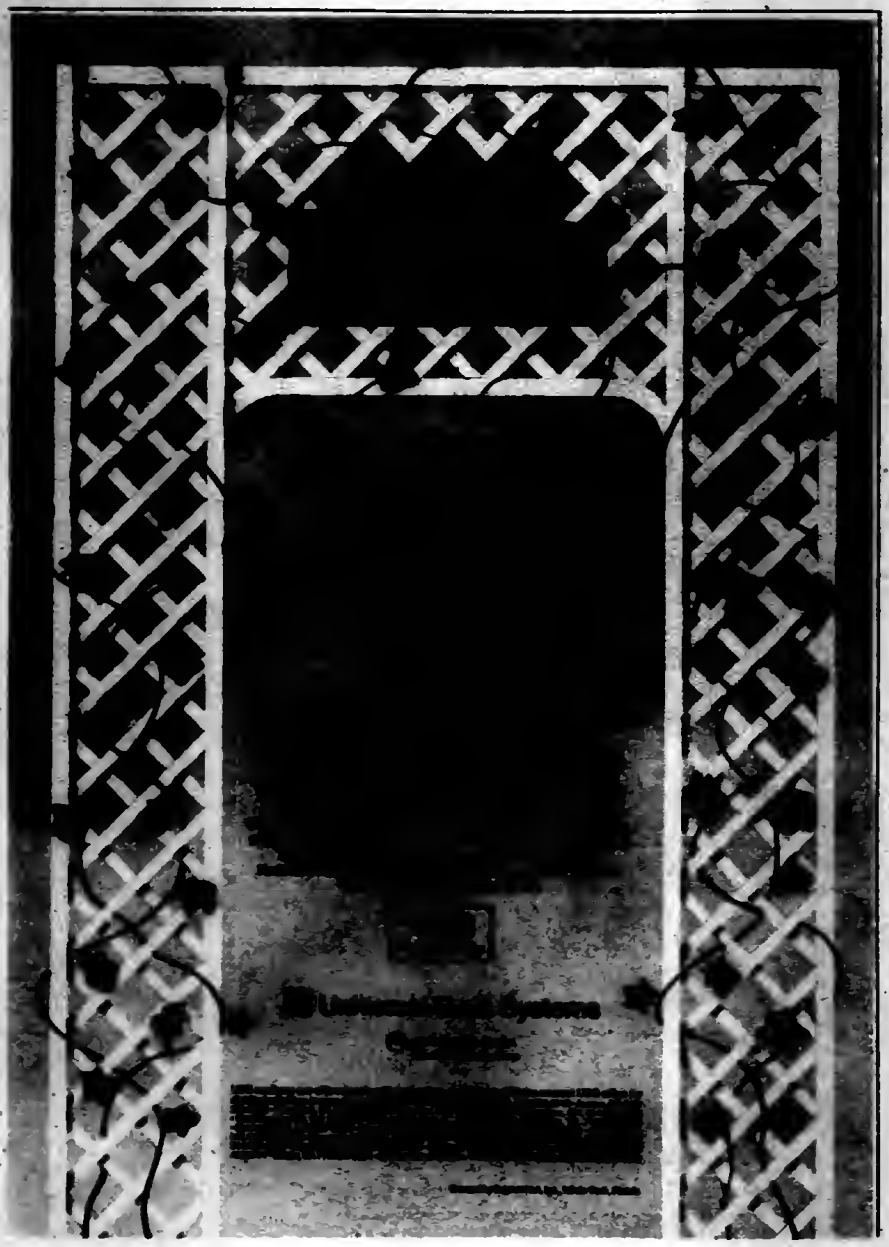
Synnott: First of all, we have to separate what the central staff unit is responsible for vs. the groups. The line groups have their own systems and programming people. Therefore, they make decisions on how to allocate their own resources, what projects to put them on and what their own business priorities are. On the other hand, my role is to establish the systems and programming standards by which systems will be developed so that they're all done in a consistent fashion.

My role is also to oversee in the early planning process whether they're going to buy or build a system. If they're going to build it, to oversee the systems design for [adherence] to the standards. If they're going to buy it, to help them find a package that fits into our architecture.

Data processing, on the other hand, is still centralized in our bank, but it is attached to the largest line unit that uses data processing, as it operates as a corporate utility. It is run by the line unit, but it has a board of directors consisting of the five group heads and myself to oversee equipment planning and capacity planning and things like that.

On the other hand, the things that are still centralized — because they fit the entire corporation — are things like telecommunications, data management and corporate systems, things that are done for the corporation, things that support the staff functions, such as finance, human resources, strategic planning.

> ***"What I brought to this job was primarily a knowledge of banking and systems, rather than a technical, in-depth background."***



So you have more of an influence on those than on data processing.

Synnott: That's right. I have a dotted-line responsibility over systems development and data processing. I have central responsibility over telecommunications, data and voice worldwide and data management. So communications and data management are becoming more of the things we concentrate on, and systems and data processing are more of a line function now.

Describe briefly your background prior to coming to Bank of Boston and your career here.

Synnott: Well, I've been with Bank of Boston for almost 18 years. What came before then is kind of irrelevant. But I did come from a bank in Connecticut, where I'd been 16 years prior to coming here. I guess the point is, my background began as a banker, and I played all the various roles in banking in Connecticut in a small bank before I came here. So when I came to Bank of Boston, I came specifically to head up the computer systems department, which is one department out of a number of them. I had had some exposure to computers in the sense that I was head of the operations committee of a 10-bank consortium that put together the first bank joint-venture computer center in the U.S.

But my background was banking, and I backed into data processing. So what I brought to this job was primarily a knowledge of banking and systems, rather than a technical, in-depth background.

Do you think that's a good background for a person to rise to a CIO?

Synnott: Well, it is because in order to be a CIO, you have to have three major skills and abilities. One of them is an understanding of the business. I came with that because I understood banking when I came here.

Is that primary? You're naming that number one?

Synnott: Yes, I think that is

IN DEPTH/INTERVIEW: SYNNOTT

primary. The second is to be, overall, a manager — a generalist manager who can manage any number of activities, including a data processing operation. And the third is to be a technician, or to at least use technology as your tools. It is, I believe, in that order — business, management and technology.

The problem is that most people who come up the technical ranks come up as programmers, systems analysts, data processors . . . and they're missing the business and managerial side of things. They try to fill it in as they go along, but it's a tough row to hoe. It's a completely different world when you're dealing in data processing and the scientific kind of perfection and logic that it represents vs. the guy who's working in business and management, which is amorphous, hazy, unstructured and people-oriented. I'm afraid that an awful lot of people in this business who've come up the technical ranks are struggling just to overcome the lack of business and management in their backgrounds. So sometime who comes to the job with a knowledge of business and picks up technology along the way has an edge in becoming a CIO.

Are some of these people afraid to move into the higher ranks, the more general management ranks, because it's a different style of people you're dealing with?

Synnott: Yes, and they're uncomfortable with it. A lot of them are uncomfortable with it. I've known a lot of people who really would like to stay out of the front office and do not want to deal with the top managers. They'd rather deal with what they're comfortable with.

It's difficult enough to cross over to managerial and business. But for people who have no tradition in it, and have come up the technology route, it's even more difficult. That's why what we're seeing, in many cases, is that the data processing manager very often does not become the CIO. In fact, somebody from the business side of the house becomes the CIO, because he understands the business, he understands management, he understands their needs. He hires somebody to be his technical guru. I'm not saying that all people do that. But there's a pretty good mixture of people coming from the business side of the house vs. the technical side to become the CIO. So the question in my mind is not whether there will be CIOs, but who will they be?

How would you suggest MIS executives prepare themselves? How can they learn the business? Do they have to do a stint outside MIS in a more general area?

Synnott: That would be helpful. There are a variety of ways that someone can learn the business and get to be a manager. One of them, of course, is to work outside of the area for a while in the company. Unfortunately, what I find is that very few companies take people from the systems side of the house and put them into their management-training programs. In fact, systems is usually excluded from the general management training program. So you have to somehow fight to get that done.

Then you need to work very closely with the users. Let's put it another way: You need to change your alliance. Instead of an alliance with finance and operations and back-office kind of people, you need to become allied with strategic planning, marketing, product management. And where that doesn't exist, the guy's not going to go very far. You're not going to use systems competitively if you're not working for the operations guy or the finance guy. You're going to end up counting the beans instead of making them.

If you work, on the other hand, for product managers and marketers, you're going to have an opportunity to not only learn their business and their products, but to be competitive with systems. That's a whole area that I think data processing people could do a whole lot more work on — trying to change their alliances.

Of course, there are schools. You can go and get an MBA or take graduate courses — all kinds of business and management courses. That will teach you business and management in general. It will not teach you your own business. The only way to learn your own business is to be in the business.

Is traditional data processing losing out here? On the lower end, end users are doing more programming and, on the upper end now, CIOs are coming in, probably from outside data processing ranks. Is data processing losing some of its power, some of its influence?

Synnott: Let's put it this way: It's changing. As you move from centralized, big mainframe computers to decentralized minis and micros, the role of data processing is changing. First of all, it serves more as a corporate data base repository, whereby people go and get the data to put on their minis and micros or offload through high-level languages information they need for management support. So in one sense, you're serving as a sort of corporate data base repository. In another sense, you're running corporate systems, those things that will never be decentralized, because they're the bread and butter of your operation, and they spread across the corporation — like deposits and loans in a bank.

You'll always be doing big data base, high-transaction-type systems, because they're too big to run any other way. But a lot of the small stuff will be going off to the user, and particularly management information systems.

I break down systems into three types: internal systems or operating support systems; management systems or management support systems; and then customer systems or competitive support systems. What we find is that the internal operating systems are where data processing has been: in the back shop, productivity-oriented in the past. Well, they've automated much of that today. It's time to move on to something else. You don't give that up, you keep it as a floor, but you move on.

> ***What we're seeing, in many cases, is that the data processing manager very often does not become the CIO. In fact, somebody from the business side of the house becomes the CIO, because he understands the business. He hires somebody to be his technical guru.***

The next thing they move to is management systems. And when you begin to move to management systems, first of all, it's difficult for the data processing people to know what management wants. So they start taking a second-generation approach, where you used to print out everything in the computer, because you didn't know what was wanted. Now what they're generally trying to do is put them on-line to the data bases and let them access anything they want — 'cause they still don't know what they want. That's sort of a second-generation approach to a fourth-generation problem.

So what's happening? The information center, which started out as a data center information center, is beginning to move to departmental information centers and now to personal computer information centers. What you're finding is that certainly the management support side of systems is moving to the end user through micros, through minis, through information centers, through high-level languages, all that kind of stuff.

Now that leaves you with the customer support systems. And I say, this is the new frontier. The sharp systems guy is going to get out there working with these marketing people and these product managers and build new systems that are technologically innovative systems that will create revenue and hit the profit side of the bank, not the expense side.

Can you give me an example here at Bank of Boston?

Synnott: Cash management is a case in point. People are putting terminals in treasurers' offices and trying to give them all sorts of help in how to manage their money. As a matter of fact, you can take that as a general strategy: terminals in customer spaces. What we did 10 years ago is we moved terminals into employee spaces, and we put everybody on-line. That took care of all the internal operating systems. Well now, when you do the customer same thing, only you put them in customer offices. In many cases, you move your back shop to his back shop. You let him do his own order entry, for example. You let him do his own cash management.

So this whole technique of putting terminals in customer offices, either on micros or on machines that access

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Synnott: Sure. Because if the treasurer has a terminal in his office, he only wants one terminal. So you're probably going to lock out your competition if you can be the first and the best there. So that same technique is being used by many banks in many ways. And not only banks.

The classic case is of American Hospital Supply putting order entry terminals in the hospitals and American Airlines with its airline reservation system. Everybody's doing that.

In a bank, it becomes cash management, it becomes ATMs, it becomes home banking, it becomes putting terminals in a real estate office so that you can tie in the mortgage application with the home buyer. There's all sorts of ways to do that. All I'm saying is, this is one strategy for getting competitive with systems. And I think that's where it's at. That's where a CIO can really play an important role today in helping to support management as and user computing goes along. He can provide some leadership and some logical control, at the same time working to build competitive systems.

Underneath it all, your operating systems will still go on. They'll still be supported by the data center. The data center will always live. But there are going to be lots and lots of minis and micros, and the key is how are you going to connect it all so that the information flow makes sense in the organization. That's where architecture comes in.

What networks do you have installed here?

Synnott: We have a variety of networks.

Is that a problem?

Synnott: Yes, it is. We have networks that we've acquired; we have networks we've built. We have three networks, for example, serving correspondent banks alone, because we built one and we bought two.

What is a correspondent bank?

Synnott: Correspondent bank data processing — doing data processing services for banks all over New England.

We have three networks there, and we had to optimize those. However, that problem has been solved because we've decided to go out of the business. We sold the business, in fact, so we're getting out of the correspondent bank data processing business. We just don't feel we can make any money in it.

But there are lots of other networks. We have one network that takes care of all of our Boston branches. We have another network that supports the affiliate banks in Massachusetts that we have bought. We have other networks that go out across the country to serve . . . banks and financial leasing companies. And then, of course, we have an international network.

Are we talking SNA or what kind of network?

Synnott: All kinds. We use a little bit of everything. It hasn't all been pulled together yet. That's what our telecommunications planning is all about. We have just finished putting in an international network, and it consists of IBM Series/1s as nodes in Hong Kong, London, Boston and South America. Access to those nodes is by any which way you can. Some are leased lines, some are dial-up, some are packet-switched networks — all kinds of things. Everybody accesses any way they want, but the fact of the matter is, if you want to print a document in Tokyo that you've written in Paris, what they do is they get on their Wang in Paris, they type the document and they send it to the London node (however they can get there). London, in turn, sends it to Hong Kong; Hong Kong directs it to Tokyo, where it's printed.

That international network is in place. Our data base structure internationally is in place because we have a common data base that goes into every office in the world. That enables us to pull off customer data, financial data and management data whenever we want to and transmit it.

Where is that data stored?

Synnott: It's on a System/34 or 36. It's a system we built ourselves. The data base is maintained out of

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London, and it's the same data base for every office. The requirements of each office that are different are built around it, so there are submodules in each office; there are different report generators and things like that. But the data base itself is tocrament. No one touches it. It's like a sealed Rolls Royce engine. It's maintained out of London. If they change it, they change it for everybody and download to everybody. So we have a common data base worldwide. That's because we were able to start from scratch and build it.

What kind of information is in the data base?

Synnott: Everything that runs the bank. Everything from current accounts to loans to money market instruments — everything that runs the bank.

We began the system in 1972, it was installed in 1976, and it was rewritten in 1980. It's ongoing all the time, but we try not to change it much, because it's pretty old now and it's been in for a while. We don't need to change it a lot. Most of the requirements that individual offices have are specific to them, and they can write their own little routines to do that. But this allows us to transmit financial data literally overnight and consolidate it and put it on the CFO's desk.

So internationally we're in pretty good shape with a communications network, a data management network. Domestically, we're not in such good shape, because domestically, it's been built up over 25 years, and you've got a hodgepodge of things. So it's a long process of amalgamating your networks and optimizing them and getting your data base management structure in place so that it gradually evolves as systems are rewritten.

Around what network are you going to optimize?

Synnott: Well, we have to simply consolidate the various networks we have into one optimized network.

So you're going to have to patch them all together. You're not looking to one network . . .

Synnott: No, but for example, we might have 10 lines going to Cape Cod, because they're all different services. Well, we'll want to put one line to the Cape. It might be a broad line. In some cases, we might be able to tie into fiber-optic services offered by Nynex [New England Telephone Co.]. But it will be one path, not 12. That's the kind of thing we need to do. How we're going to hook it all together is a combination of what we can buy from Nynex or Nynex vs. what we can do ourselves. We do have pieces. We have microwave, for example, from here to our data center. We've been running all data between these two sites off microwave for years.

Is there any other spot within Bank of Boston where you could move now?

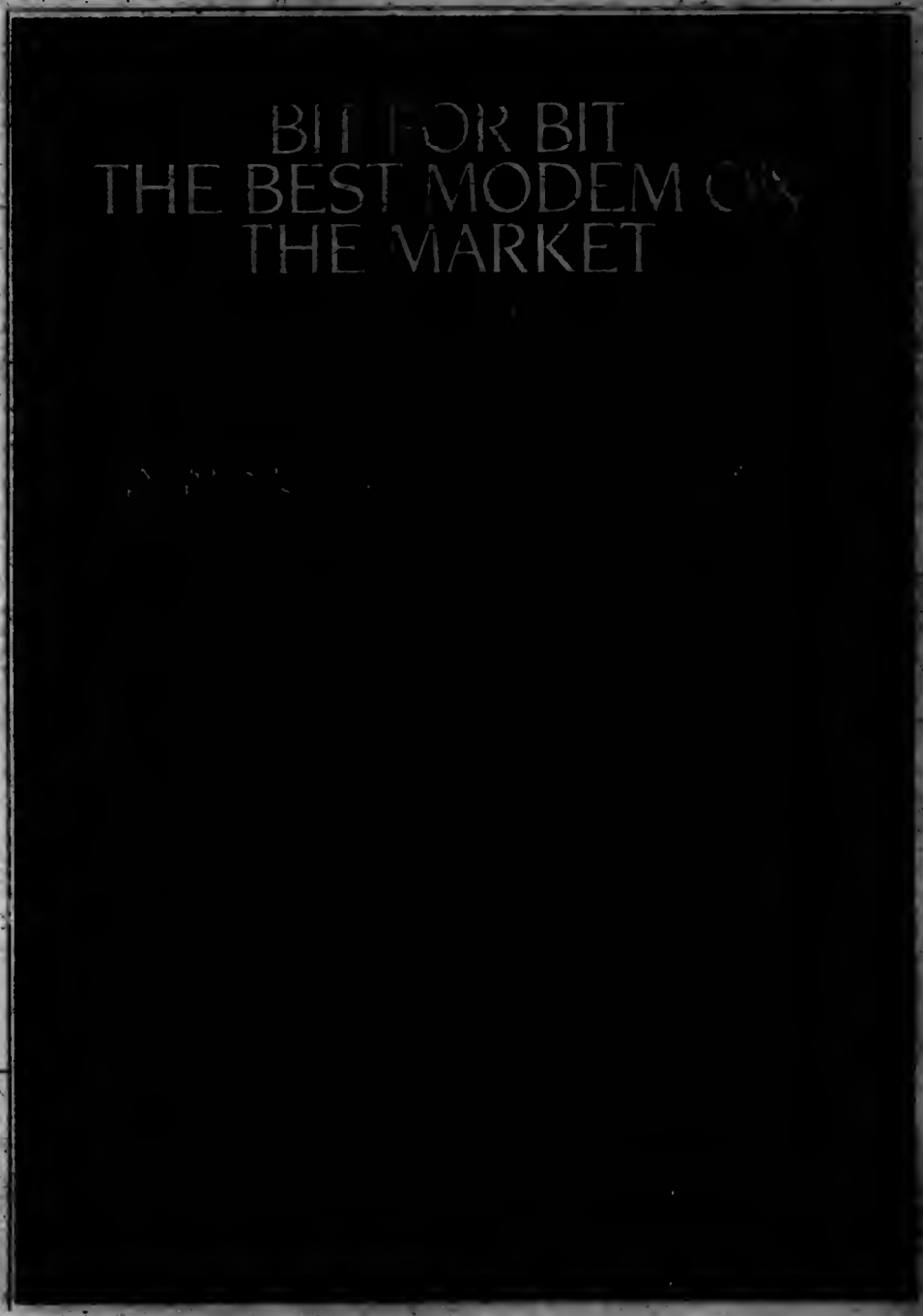
Synnott: If I wanted to get out of data processing, there are probably other places that I could go, becoming more of a banker. If I want to stay in this field, there isn't any place to go.

Do you want to stay in this field?

Synnott: Yes, because I've been in this field long enough. I enjoy the field, it's a rapidly changing one. I wouldn't want to get out of the field altogether, because frankly, when I retire, I want to go into this business as a consultant. I wouldn't want to get out and run personnel or buildings or something else. I'm too close to ending my career to want to change it.

But it is true that if you reach the top of the ladder in the systems world, there isn't any place to go unless, as a CIO, you broaden your role and responsibility, you become more a part of the executive team.

The only logical extension I can see is to move into strategic planning. As strategic planning gets more product-oriented and as technology becomes more competitive, that's a nice logical extension.



Interview: Haskin

(David Haskin is senior vice-president, Corporate Resources, at Northwestern National Life Insurance Co. in Minneapolis, Minn.)

Did the CIO position at Northwestern exist before you came to fill it?

Haskin: No, the position resided in two separate areas: MIS was under the chief financial officer, and Human Resources reported elsewhere.

Who decided to create this position, the president?

Haskin: The chairman and chief executive officer. My particular background and talents had something to do with that. The chairman, when I decided to come back into the insurance business after having left it for four years, created this spot.

What is your background?

Haskin: I've been here about a year, and I'm head of MIS and Human Resource Services. I was at Minnesota Mutual Life for 17 years in a similar capacity, handling MIS, human resources, administration.

Was the CIO job created in response to a particular need within the company?

Haskin: At the time, about a year ago, the MIS function was in need of some overhaul. The systems we had in place hadn't been redone for a number of years — that needed doing. The concept of chief information officer was fairly new to the company. I don't know if you would give that title directly to me now, or if the company would even recognize that's what we're moving toward. But that's the way I'm shaping the function.

You are certainly reporting at a high level.

Haskin: Yes, to the chairman and chief executive office. The company split up — the chairman and chief executive has most of the staff units reporting to him; the president has three line units and some subsidiaries reporting to him.

What are you able to accomplish as a CIO that your predecessor — who had the responsibility for MIS but not the high reporting status — could not do?

Haskin: It's an evolving function. What's happening is the recognition that in the financial services industry, information is a resource to be managed just as much as any other resource. In the past, most companies looked at information as an accounting kind of function or as a financial reporting function or what have you. There's a growing awareness that because you have this data base of information, you can use it for competitive and strategic advantage.

How have you used information strategically?

Haskin: We're just beginning the function. As an old-line insurance company that's coming into the financial services industry, we've started to recognize that our competition isn't the traditional groups of people in the insurance industry who we've come up against. It's Sears, Dean Witter, American Express — you don't know where it's going to come from next. As a consequence, we have to look strategically at what those companies are doing and how they're marketing their services and what kinds of distribution systems they're putting up and so on. That's the kind of data that in the past it would have been nice to know; in the future, it's survival.

When did the company shift toward financial services?

Haskin: It's been gradual. About two years ago, we organized into profit centers and changed our distribution system from the traditional captive agent kind of company to more of a "brokerage" operation.

How many employees does the company have?

Haskin: In the home office, there are a couple of thousand. There are nine claim offices, 25 group offices and a field force of 6,000 agents. That's just Northwestern National Life. We have a subsidiary on the West Coast, Northern Life, and a subsidiary on Long Island, North Atlantic Life.

Does your responsibility include all three?

Haskin: Northwestern National, right now. We provide certain MIS services to the others.

You said that prior to your coming, the systems hadn't been changed in many years.

Haskin: I think a lot of firms developed systems that fit the traditional batch processing, serial processing kind of mode. The products and distribution systems fit that well. Today you have to be more responsive to the changing marketplace, more responsive with product changes, more responsive to the needs of your distribution system. It kind of equates with a data base design. When you get into relational data bases, you start to gather a lot of information and look at it in a different way than you did in the past.

In your MIS position prior to Northwestern, were you involved in daily MIS operations or more of a management role?

Haskin: More from a management perspective.

You came up then from the managerial side?

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Haskin: As a matter of fact, I came up from the human resources side. I have a master's degree in industrial relations. I started in the life insurance business in the personnel area and gradually added functions to my scope of responsibility. MIS came under that at one point in time. I took some interest in it. I built a time-sharing company, a subsidiary for Minnesota Mutual. That was 10 to 12 years ago.

It seems to be a pattern that the chief information officer is not coming from the MIS ranks.

Haskin: I think that's probably true, because traditional DP ranks look at the technology side of the house more often than the information side.

It's not a technological problem — in part, sure — but by and large it's a problem of what are you going to do with your information and data and body of knowledge, rather than how you process it or [whether you] have the latest operating system and so on.

> *I came up from the human resources side. I have a master's degree in industrial relations. I started in the life insurance business in the personnel area and gradually added functions to my scope of responsibility.*

But just as you have learned enough about the technology, couldn't someone come through the technology ranks and learn the management side?

Haskin: It can happen. It's a matter of managerial style and how you view your role and function.

Who reports to you?

Haskin: The head of Human Resources and then five direct reports from the MIS side — technical services, operations, data administration services, telecommunications and corporate applications systems.

Do you sit on a policy committee for Northwestern?

Haskin: Yes, Northwestern National Life has an operating policy committee of eight people.

Are you looked to as the technology advocate?

Haskin: In a general way. On any heavy technology questions I'd go to one of my direct reports.

What mainframes are installed at Northwestern National?

Haskin: We have three mainframes right now at headquarters, a 3084Q, 3081K and a 4381, all MVS/XA.

Do you need more power from your systems, such as from the IBM 3090 series?

Haskin: We have a 3090 on order due to be shipped in December, and then we have a position order for the 400, when that comes out. In our capacity planning projections, we believe that somewhere in 1990 we will have the equivalent of three Qs in place. That's how we project our power requirements, which will probably be the 3090 400, or whatever it is at that time.

We're in the process now of distributed processing, looking at the departmental machines, and, of course, personal computers are all over the place.

IBM Personal Computers?

Haskin: Harris Corp.

Was that choice made before you got here?

Haskin: Yes, that choice was made before I got here.

Is there any thought of changing? Are there others on the recommended list?

Haskin: Yes, Harris just happens to be predominate right now.

What networks are in place?

Haskin: SNA, and we're putting in Disoss this year.

The load on information systems is tremendous in an insurance company.

Haskin: Quite heavy. We look at a growth rate of about 40% per year right now.

How many transactions enter the system in any given period?

Haskin: That's difficult to say. In group claims, we're processing probably 12,000 to 15,000 claims a day.

Do you need a fault-tolerant system?

Haskin: I haven't seen the need for that. I expect that when we get to where we're headed in on-line agent-to-customer kind of processing, we might want to consider that. But our downtime or failure rate has been so small. We probably run 96% to 99% availability fairly consistently.

How do the agents communicate right now to the home office? They're not linked on-line?

Haskin: No, they're not on-line. Most of them have personal computers, and we send them out diskettes on various kinds of products.

Do you have a time period in mind for bringing them on-line?

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Haskin: We want to establish throughout the home office our data base technology, which we hope to have done by the end of 1986. During that period, we're also looking at how we'll link our field force.

Any of your five within MIS who report to you would study the issues and make recommendations to you?

Haskin: The company is decentralized into profit centers, and the applications programming is done there and reports to the profits center head. Each of the directors and vice-presidents in that area sit on a strategy policy committee of which I am the permanent chair. That committee sets the policy for standards and processing and protocols. How they do their applications programming in the group area — that's up to them, but they have to follow the established standards and link to corporate.

How do you keep up with the technology. Do you really need to?

Haskin: I think it's impossible to keep up with the in-depth technology. There is such a variety of magazines; I pick two or three. Mostly I read publications that deal with strategic issues rather than in-depth technological issues. I know what systems software is capable of. How it's put together — that's something else.

How about your competitors within the insurance and financial services industry — do they have positions like yours? Is that where the industry is heading?

Haskin: I was at a meeting of the conference board, and they asked how many people were headed that way. There was a scattering of hands, not very many had the true chief information officer. I'd also guess that if you asked some people at Northwestern National Life what a chief information officer is, you wouldn't get a very clear definition. I don't know if I can give you an absolute definition.

What is your definition?

Haskin: It's an individual who takes the MIS function and uses it to its full capability in providing information and knowledge to operating policy members who can use it in a strategic way. It goes beyond just financial data. It goes to what the competition is doing, what the marketplace looks like and so on.

You have Human Resources under you. Is that just because of your background, or are Human Resources and MIS a particularly good mix?

Haskin: It's probably because of my background, but I also happen to think it's a good mix.

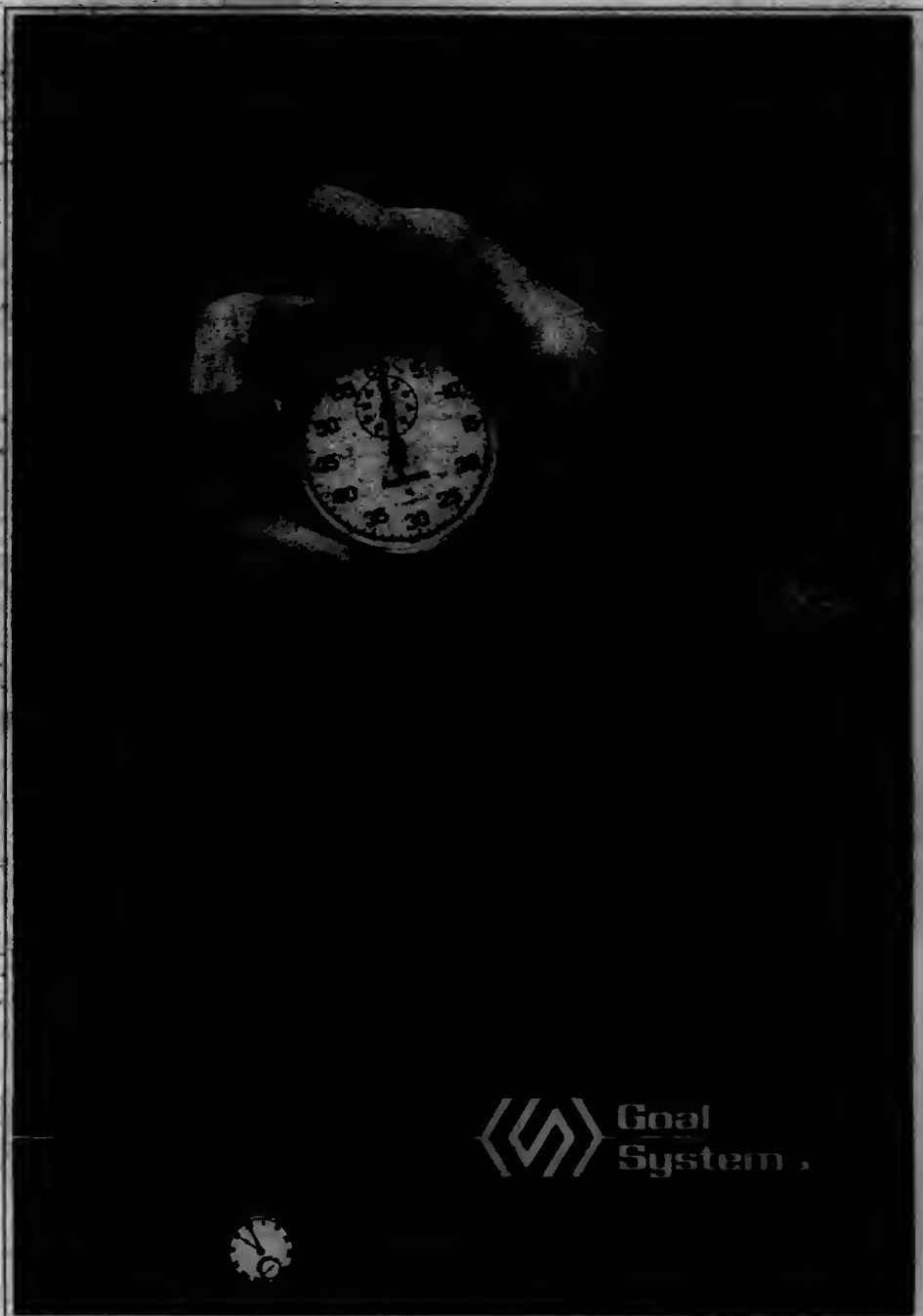
What kind of synergy is there between the two?

Haskin: I think it provides some synergy in the MIS area because traditionally, those folks have had a heavy technological orientation and somewhat less of an orientation toward the interaction with operating management. I think by bringing some of the human resources methodologies and techniques to that group, it gives them a growing awareness of how they really can be mainstream to the company's operations.

Are you the connection between the two, or are there other connections between Human Resources and MIS people?

Haskin: There are links further down the line and throughout all the divisions. Human Resources is for all

> ***"You look at the MIS resources at Northwestern National Life, and they account for probably a quarter of the company's operating budget — an operating budget of $100 million."***



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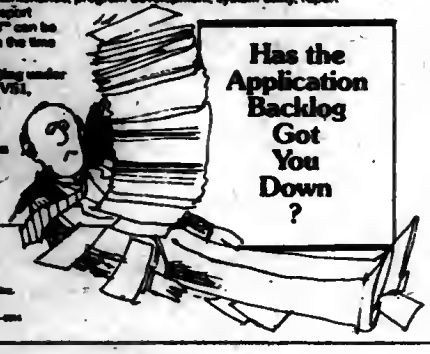

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A real problem for us as we continue to expand and develop our systems is qualified, capable people. How you identify them, track them and train them is as important to me and to the company as the technology.

Northwestern National Life, not just MIS.

How well do Human Resources people and technical DP people talk to each other?

Haskin: Better. I have a very strong belief that MIS people have to have a much firmer grasp and understanding of the business. I also believe that business people have to have a much firmer grasp and understanding of what MIS can do for them. For years those people didn't speak a common language.

Does one learn the other's language, or do they meet somewhere in the middle?

Haskin: It's essential that they meet in the middle.

Do you have training courses and educational seminars to get the two communicating?

Haskin: We're working on that. I demand of the MIS people that they learn the insurance/financial services business and that they can speak that jargon. And I'm providing the business people with some high-level kinds of functional courses of what you can do with this MIS resource. You look at the MIS resources at Northwestern National Life, and they account for probably a quarter of the company's operating budget — an operating budget of $100 million — and we're spending $25 million on MIS. To me, if you're spending that kind of money, it's absolutely essential to understand what you're going to do with it.

How many MIS people work at Northwestern?

Haskin: About 325. Some of those are applications programmers who report to the profit centers.

Do you use a micro?

Haskin: No. I just brought in a Rolm Cypress. The reason for that is we put in a Rolm switch a month ago to handle our voice and data traffic, and I'm experimenting with this Cypress, which is an intelligent terminal with a telephone tied in.

Was the decision to bring in the Rolm switch made prior to Rolm's connection to IBM?

Haskin: Yes. Well, it was made when IBM owned about 25% of the company.

Did that affect your decision?

Haskin: I was pretty convinced that IBM was moving in that direction, and I thought it was a safe bet. And the Rolm technology in either case is solid.

What do you use a micro for?

Haskin: Right now, one of my first applications would be in tracking some of our Human Resources situations, which may sound kind of strange. But I think a real problem for us as we continue to expand and develop our systems is qualified, capable people. How you identify them, track them and train them is as important to me and to the company as the technology.

Is it roughly a balance, 50:50, of your time spent on Human Resources and MIS?

Haskin: In the past year, it was probably 75:25, and now it's coming around to 50:50. Initially, MIS took

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IN DEPTH/INTERVIEW: HASKIN

more of my time because I wanted to reposition what we were doing.

Did you establish this reporting structure with the five within MIS reporting to you?

Haskin: Yes. The traditional way it was organized was with a single head running all of MIS. I wanted to open it up, get into it a little more,

> **"The person who manages and controls the network is the backbone of our business."**

and I think that by the way we are set up, the individual functions are moving up to more of a major status. Take telecommunications, which used to be sort of a sideline function. It's mainstream and vital to us right now, because if you can't move the data and the information around in a proper and efficient manner, you haven't got anything. The person who manages and controls the network is the backbone of our business.

In creating five MIS positions where there was one, you diffuse the power of any one person within MIS. In this restructuring, did you lose any key DP people?

Haskin: Not a one — well, the old head of MIS left.

Would you agree with my description of what happened — that if you are the CIO, a good way to centralize the power and responsibility for yourself is to diffuse it lower down and then have those people report to you?

Haskin: That wasn't my intention to do it that way. My intention was that each of those particular functions in themselves is of growing importance and so you want to upgrade the stature of them.

Is there a micro on the desk of your president or chairman?

Haskin: Not at this point.

What are their attitudes toward technology? How central are computers and information to the success of Northwestern?

Haskin: Both the president and the chairman have said publicly that our most important strategies for the future are our people and our systems. Without our people and the systems, we're not going to go far.

That's elevating systems very high.

Haskin: I'm talking about systems in a broad sense now, how you deliver your product, how you report to your customer and so on.

So what information systems can do is get the information in and out faster?

Haskin: It's the arteries of the company.

As a CIO now, are you able to move to any position within the company?

Haskin: I think it's a marvelous training ground or spot to take a view of the entire company opera-

tion. There's no question about that.

There are four other senior vice-presidents?

Haskin: On the operating policy committee, there is the chairman, the president, two executive vice-presidents and four senior vice-presidents — the head of our investment operation, the chief financial officer, the general counsel and myself.

Is there anything else about the CIO position you would like to say?

Haskin: I'll say one thing. It's very much an evolving position. What does chief information officer mean to Northwestern? There has to be input from various people and groups, customers and clients that will solidify what this is all going to mean when you take a look at it three or four years out.

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Interview: Irwin

(Dan Irwin is director, Information Resources, at FMC Corp., the Chicago-based manufacturer of machinery and chemicals.)

Who created your position?

Irwin: There's probably not a simple answer to that question. The position was recommended by a task force appointed by the president of the company to determine, among other things, how we should organize to incorporate office automation technologies most effectively.

So he wasn't necessarily thinking of a CIO position?

Irwin: Right. And the task force recommended that a position be created that would bring together from a variety of different places in the company traditional MIS business systems and computer operations, telecommunications, technical computing (computer-aided design and manufacturing is the most visible reflection of that) and office automation.

What problems or possibilities did the president have in mind when he began this task force? It must have been a response to some situation at FMC.

Irwin: Well, it was in response to a lot of emerging technologies, particularly in the office area. There was a lot of demand beginning to come from within the company, without a good understanding at the senior management level of how we should manage this technology in conjunction with all the other information technologies. That concern spawned the creation of the task force, which had a broad representation from around the company — from operating groups and corporate staff. It probably had more line than staff representation. It had a management orientation as opposed to a technical orientation.

Whom do you report to now, the president?

Irwin: Yes.

Was there a vice-president of MIS before?

Irwin: There was a director of MIS who reported to the chief financial officer.

So your position required a major realignment of the reporting structure.

Irwin: A realignment, yes. It moved all of MIS from finance into its own area — information resources. It took technical computing from corporate manufacturing, and it took all of our office information support functions here in Chicago from the administrative department and put them in our section.

Is telecommunications a subgroup?

Irwin: Telecommunications was in MIS before, and now it has been made peer level with systems and computer operations.

So we have systems, computer operations, telecommunications . . .

Irwin: . . . technical computing, office automation — five functional areas report to me.

What is your mandate?

Irwin: To take the technologies that are available and will become available and use them to the strategic advantage of the businesses in the company.

Your background is not in data processing or MIS.

Irwin: That's correct.

It was determined by the task force that it would be better . . .

Irwin: That was a recommendation that the [person] in this position have a broad business background, an operating business background, as opposed to a technical background. The task force recommended that whoever was appointed to this position be from a background of general operating business management.

Was there also the hope that this person have some interest in and some familiarity with computer technology?

Irwin: Oh sure.

What interest in your past would . . .

Irwin: Well, there's not a business that I've managed with FMC that hasn't had systems as an integral part of it.

Could you briefly sum up what you've done at FMC?

Irwin: I started out in the petroleum equipment business, spent 15 years in both of our divisions there and at different times managed both of those divisions.

I came to Chicago after 15 years with FMC as director of business planning and, in that capacity, had responsibility for working and supporting our businesses in the development of their strategic business plans.

Is this a position that you sought?

Irwin: No, not really.

Did you have any hesitancy about taking it when you were approached?

Irwin: Absolutely none.

How do you keep up with changing computer and office technology?

Irwin: In the traditional ways. Vendors are a very good source. My counterparts in other organizations. My own people and what they bring

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IN DEPTH/INTERVIEW: IRWIN

forth. I encourage them to continue to test and try new things and bring them to the fore because I think research and development — not in the product sense but in an acquisition of what's available sense and what might make sense to us — is a very vital part of the role we have to play. I would characterize that as research and development very similar to the kind of R&D that you do in product development in an operating business. Trade literature. Your publication, among others. Conferences.

Will you attend, particularly since it's in Chicago this year, the National Computer Conference?

Irwin: Yes, I intend to do that. I've done a lot of learning in the last eight months.

What's the hardest to learn? Software is often thought of as one of the toughest areas to really understand.

Irwin: You know, I guess part of it is what you want to learn and what you think you need to learn to carry out the mission that you have. I don't think to carry out my mission I have to have a nuts-and-bolts knowledge of Cobol, for example, or a nuts-and-bolts knowledge of how a particular piece of software is put together.

What do you need to know?

Irwin: What I need to know is what a piece of software can do, functionally, what it's going to cost to perform, the people development and hardware costs, and what it's going to provide the business on the benefits side. That's much more the role that I have to play.

And it's up to me to be sure that I have the right technical people in place, making the right technical judgments that go into the cost side of applying those various technologies.

Do you need to understand something like Unix or MVS?

Irwin: You need to understand what it does, sure, and how it communicates or does not communicate with its counterparts in the industry. One of the things we have to be sure over time is that we end up with a network of workstations that, for all intents and purposes, can communicate with any other workstation. We're a long way from being there, but every step that we make today either enhances or inhibits us in moving in that direction.

Do you use a microcomputer?

Irwin: On a limited basis, yes.

What kind?

Irwin: That's a Wang personal computer, and it's hooked up to our VS system here in Chicago.

What does it take for a professional, at whatever level at FMC, to get a micro on his desk? What need does he have to show, or what authorization?

Irwin: The task force recommended that each location of the company should establish a task force that would be multifunctional — in other words, have a representative from each of the departments — to go through a planning process that would determine the communications pattern as well as the needs for workstation capabilities. [This task force would] define what the requirements were for the whole unit on an integrated basis. And out of that rolls the equipment needs and the justification for each individual.

We are in the process of doing that here in Chicago. Last summer, we put in a number of workstations on a pilot basis. That was to allow some of us to get some live experience with the technology and to be able to make some judgments about the reasonableness of justifications that were going to be coming forth in, or out of, these task force recommendations. Hence, that's how I got one of them.

But we're building, I think, a good solid base on which to make judgments as to whether applications make sense and will provide benefits or [whether] they're nice to have, but not necessarily justifiable.

Did you use a micro before?

Irwin: Not to any great extent. I've had an Apple at home for a couple of years, and I do some personal things on that, but nothing related to FMC.

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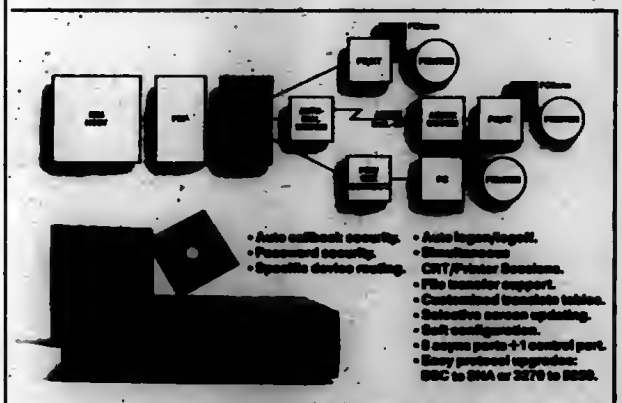

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How many divisions are there, or separate locations, of FMC?

Irwin: I just read that in our annual report last night. There are more than 100.

Did you consider FMC technologically behind before the creation of this position?

Irwin: No. I think a better way to characterize it is that we recognized a wave of technology coming. If we continued our old pattern organizationally, we were likely to miss opportunities that were going to be there for us as a company.

The benefits of information technology are often, or sometimes, hard to measure on the bottom line of an annual report. How will your success be measured?

Irwin: I'm very hopeful we'll measure some of it on the bottom line. I hold out for that and expect that we'll be able to.

In what year? When would it start showing up?

Irwin: Oh, I would think we'll start to see some benefits by sometime this year or '86, but the real big bangs may be '86 or '88, down the road. By the real big bangs, I mean where we could take the technology and apply it in a unique, an unusual kind of way in a business to get a competitive advantage.

Can you give an example of how that's taking shape right now?

Irwin: Well, during the time we were running a pilot in one of our businesses, we put all of the field sales people on the voice messaging network. As a result, we were able to eliminate a layer of management.

> ***We now have other businesses that are exploring putting some of their customers on our voice messaging system to improve communications — order expediting, order change and so on. We found that to be a very effective technology.***

And they implemented that before we ever got out of the pilot on voice messaging.

We now have other businesses that are exploring putting some of their customers on our voice messaging system to improve communications — order expediting, order change and so on. We found that to be a very effective technology. That is an example of where we clearly cut the field sales administration cost in that one business by eliminating one whole layer of management, just because one regional manager is now able to communicate effectively with 50% more people than he was when they were playing telephone tag all the time.

It also creates a stronger link to your customers.

Irwin: It sure does.

Who lost power in order for you to get power? Is the MIS department or traditional data processing losing power in this realignment?

Irwin: I don't think of it that way. I see us as bringing together all of the information technologies in a way that they perhaps even gain power, because they're stronger with the balance that's there than they would have been before. And we don't think a lot in terms of power in this company.

Is your office here on the 67th floor a statement by the company of a greater emphasis on the use of information technology?

Irwin: Yes, that's true.

Who are your major competitors in petroleum and chemicals?

Irwin: As you probably know, we're a pretty widely diversified company, so we run into a lot of different companies. In the petroleum equipment business, Cameron Iron Works would be one competitor. Combustion Engineering would be another.

How do you measure yourself to your competitors in terms of using information technology. Do you worry that they are getting the strategic edge on you in terms of using new technology?

Irwin: Yes, we sure do. And one of the functions that I think we need to perform, and we've a long way to go at it down in my department, is an effective surveillance of the competitive environment, of the companies that we compete with. And I see that as a role that we should play.

How does one go about that?

Irwin: Oh, I think in the same way that you do in the business itself. Competitive intelligence. Just through the networks that are there.

When you first took your position here, I assume you called in the managers of the five areas that now report to you. What did you tell them would change in terms of using information technology as a corporate weapon?

Irwin: Well, I said, first of all, that's going to be our emphasis — using it as a strategic weapon as opposed to a cost-reduction mechanism. I told each of the people who report to me, "I'm looking to you to provide leadership in your area. Seek those opportunities, get them to the surface so that we can get them in front of the people who are running our business, and they can take advantage of them where it makes sense." That was one of the first things I said.

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wrong. I assume the company understands that's a real possibility.

Irwin: I think you're right, Dave.

Did you lose any managers in this realignment?

Irwin: Yes.

> ***"We ended up approving two vendors as full OA suppliers and a third as a personal computer workstation only."***

People who were more comfortable with the old ways of operating?

Irwin: I don't know that I could characterize any generalizations, and I'd just as soon not do that.

Did you know before taking this position what mainframes the company had in place — by models?

Irwin: Absolutely not.

Do you know now?

Irwin: Yes.

Were you surprised?

Irwin: No. Because what I knew was that our predecessor MIS department had consistently followed a strategy of adopting the latest technology as it came forward in mainframe hardware and operating systems and implemented and done it very cost effectively. And they'd done a hell of a good job. So I knew in that sense where we were. But to talk about an IBM 3084 — that meant nothing to me.

What mainframe systems do you have now?

Irwin: A 3084, 3081, and we're in line for a Sierra when they roll off.

So the IBM announcement would be something you would be very up on. What would you be looking at — the 300 models, or would you be waiting for the more powerful 400 model?

Irwin: Honestly, it will depend on where it fits into our capacity expansion requirements in terms of timing.

You're an IBM shop.

Irwin: We are today.

And tomorrow?

Irwin: We are today.

Would there really be the possibility of going to one of the plug-compatible manufacturers or one of the Bunch companies?

Irwin: I think anything's always a possibility.

How about in terms of micros? Do you have a "recommended" list?

Irwin: That came out of our OA task force last year. Micros were viewed as a subset of office automation. In other words, they are a type of workstation that should fit in an OA environment. And we ended up approving two vendors as full OA suppliers and a third as a personal computer workstation only: Wang Laboratories, Inc. and Digital Equipment Corp. for the complete systems and IBM for the Personal Computer only. We've reached a decision now with IBM's new System/36 announcement to give that the blessing. So those are the standards that people in the company are following today.

Right now your Wang does not talk to your IBM, does it?

Irwin: Not very effectively.

And do either of them talk to . . .

Irwin: They all talk to the mainframe.

The Wang doesn't talk to the IBM Personal Computer. That has to be one of your problems.

Irwin: It is a problem. That's why we draw the line where we have, and we're working on these interface problems.

So what you want is a network that ties them all together.

Irwin: That's right.

You don't particularly care who it comes from.

Irwin: That's right. Whoever it comes from ought to provide the best functionality for the business function that we deal with. In a number of our businesses, which are engineering-based, a vendor that has good engineering hardware and software is likely to have an advantage over one that is more business-oriented. And all of that has got to be rolled together.

Apple Computer is absent from the list.

Irwin: It just hasn't been there with a product that can communicate with anything we have.

The Macintosh Office?

Irwin: I don't know.

That was just announced.

Irwin: I know. And I have not seen an evaluation of it.

But you're satisfied with the three you have.

Irwin: I think they cover our needs pretty well.

Do you know how many personal computers exist in PSEC?

Irwin: Throughout the company? The answer to that is no, but it's somewhere between 600 and 800.

Do you see a lessening in the influence of traditional data processing, given the trend toward end-user computing and end-user programming? It seems we have a

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movement away from programming in a centralized data processing department and now here, at the top end, we have an executive — you — coming from a non-MIS background. It seems data processing is squeezed a little bit or is just losing some — you don't want me to use the word "power" — some influence.

Irwin: I think you're fishing for that. And I don't think that's necessarily appropriate. I think the jury is still out on where we'll be five years from now in terms of distributed computing vs. centralized computing. And what I have seen and heard up to this point would tell me more experience is going to be necessary for us to see.

But you obviously are going to see smaller and smaller boxes with more and more power, it's going to allow you to push capability to the end user. And you're going to see an increasing array of software that is easily used by the end user, that is probably going to enlarge the whole of the computing field, in a sense. But golly, I don't see at the same time a replacement of your traditional data processing, because those large systems applications have to [get done]. At least that's how it seems to me. But where that balance is going to end up is hard to call at this point.

> *I don't see at the same time a replacement of traditional data processing, because those large systems applications have to [get done].*

Fourth-generation languages — are they commonly used through the corporation?

Irwin: Reasonably commonly, yes, as part of that research and development effort that I'm talking about. We have brought some in. We are actively using some fourth-generation languages in program development today. We are researching others, testing others.

Which ones are you using now?

Irwin: Well, [Management Decision Systems, Inc.'s] Express is one that we've done more with than, I think, anything. I've never been quite sure whether you classify Ramis [Mathematica Products Group, Inc.] as a fourth-generation language or an end-user language, but Ramis is heavily used throughout our company.

What do you generally use your micro for?

Irwin: I basically use it for personal kinds of things: calendars, we share calendars now amongst our group. Several of the people that work for me like to send electronic messages on it. I typically will answer their messages with a VMX, because that's more comfortable for me to use than the electronic messaging.

I saw a speech recognition system at IBM. It's obviously not a product yet. But would that be something that you could use a real use for here? An executive speaks into the system, the words come up on the screen and then it can be sent off?

Irwin: I think that's where it's headed. I think that is one large step toward making the technology user-friendly to a much larger segment of the work population.

Do you consider your micro user-friendly at the moment? Do you feel comfortable with it?

Irwin: Oh yes.

And you still have an Apple at home, but the Wang here. Which do you prefer? Would you say one's more fun, one's more productive?

Irwin: With the Apple, I don't have the same kind of power because it's not tied to a mini. You know, it does the things I want to do at home. Probably the biggest inconvenience is that the word processing on it is different in some characters from the word processing on the Wang. So you kind of have to sit down and get your act together before you run off a letter or something. And especially if you don't write that many letters, which I don't.

Let's get back to management. How many people report to you?

Irwin: About 260.

Was there any loss of staff within data processing?

Irwin: No.

Have you encountered any particular resistance? We talked about several people leaving, but could you characterize what . . .

Irwin: The answer to your question is no. It's been the opposite: a lot of enthusiasm, both on the business side of the house as well as our more technical side of the shop.

Is the task force still in existence?

Irwin: No. The task force officially disbanded with the creation of this department.

Could information technology have been used in the kinds of ways that you're using it now without the creation of your position?

Irwin: Sure it could have. Well, the forces to pull it together would not have been as highly focused as I think we've got it now. I think that's a key part of any organizational decision that you make.

"When DEC systems break down, my customers don't call DEC"

IN DEPTH

What's on your mind?

Part 2

In the end-of-the-year Forecast issue, we printed seven controversial statements and invited reader response. The best of these responses appeared in the March 11 issue. The new survey below deals solely with microcomputers. Respond to as many statements as you like, but we prefer longer comments (50 to 150 words) on one or two of them. Feel free to write in the space below or on a separate sheet of paper.

Please tear out this page and mail it to:

Survey
c/o George Harrar
Senior Editor, Features
Computerworld
P.O. Box 880
Framingham, Mass. 01701

1

We have a formal policy controlling the purchase of micros, yet no one knows exactly how many there are or what they're used for.

2

Software copying is a vendor problem, not mine.

3

End users get a lot out of their micros — including games, calls to their favorite on-line data base and personal word processing.

4

Micro equipment is so cheap that price doesn't prohibit purchase. But the hidden costs are huge.

5

End users want to share data, so this year we're setting up a microcomputer local-area network.

6

We give end users all the tools they need on micros, but the load on DP hasn't lessened.

We might run your responses in a future *Computerworld*. If you would like your name and company affiliation withheld from publication, check here ☐

Your name _____ Your title _____

Company name _____

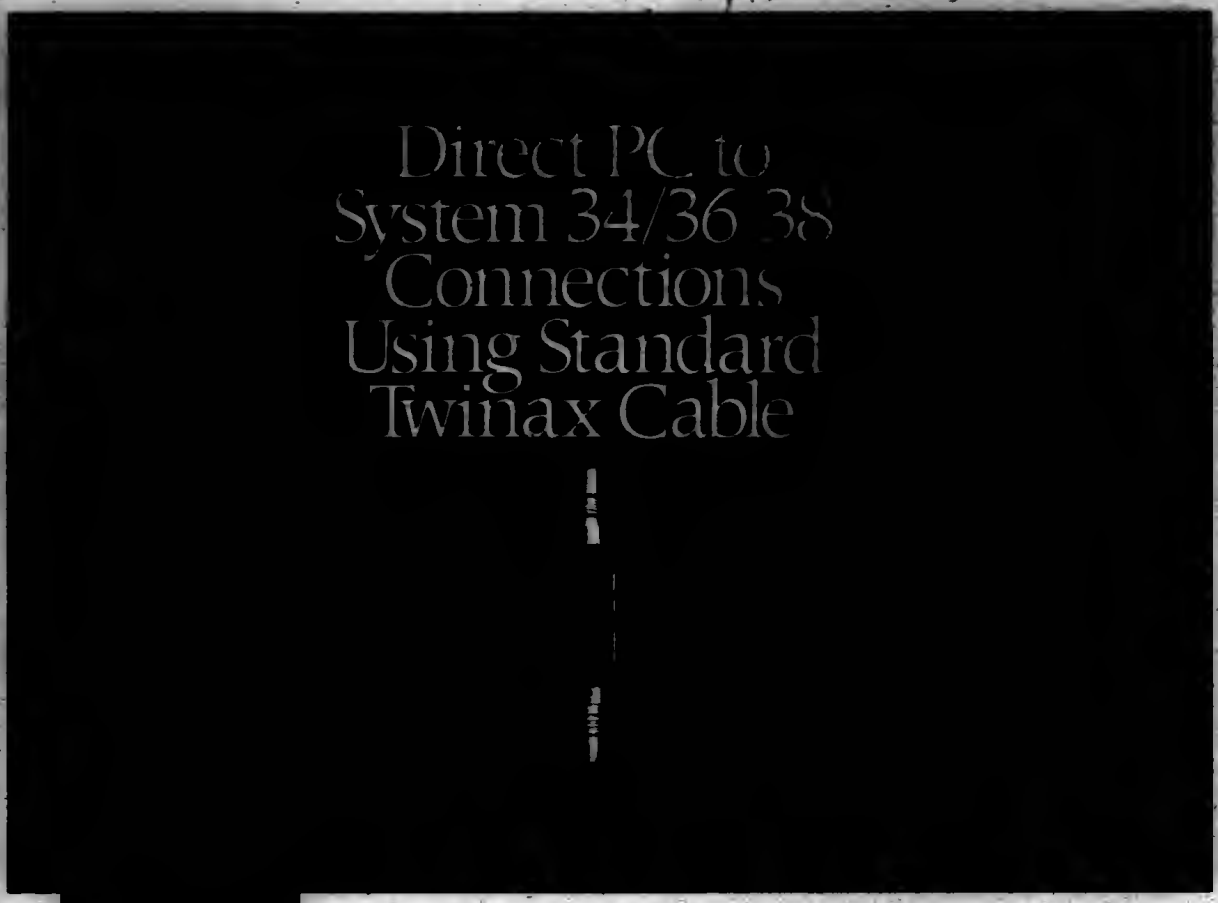
Company location _____

How many people work in your DP department _____

What is the DP department's annual budget? (if known) _____

What topics would you like to see covered in greater depth in *Computerworld*? (for instance, more product analysis, more micro news or features, management issues, technology updates and so on)

Direct PC to System 34/36/38 Connections Using Standard Twinax Cable



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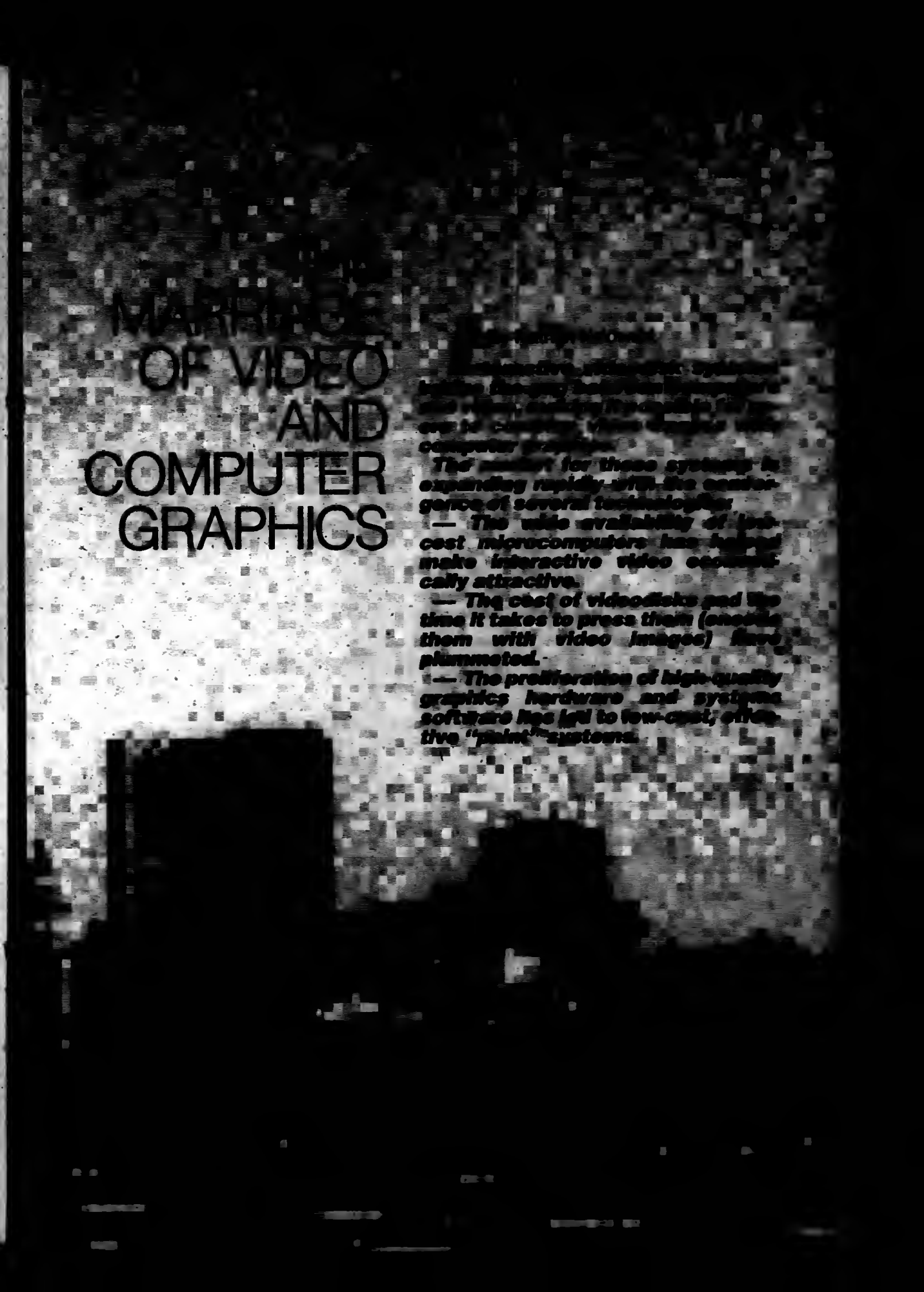

MARRIAGE OF VIDEO AND COMPUTER GRAPHICS

[illegible] interactive videodisc systems [illegible] computer graphics.

The market for these systems is expanding rapidly with the convergence of several technologies:

— The wide availability of low-cost microcomputers has helped make interactive video economically attractive.

— The cost of videodiscs and the time it takes to press them (encode them with video images) have plummeted.

— The proliferation of high-quality graphics hardware and systems software has led to low-cost, effective "paint" systems.

Users who have a personal computer with a videodisk controller and graphics tools can develop text, menus, graphics highlights, charts and other descriptors and can display them in conjunction with photographed video images.

To produce the displays, a developer places the graphics images that he has created on a microcomputer over photographed images he has stored on a videodisk. The videodisk allows the developer to present photographed images in any sequence: forward, reverse, slow motion and the like. The microcomputer lets him annotate and highlight the video progression with still or animated graphics.

Richer interface

This marriage of videodisks and graphics provides a richer human-machine interface than either video or graphics offers alone. In fact, it begins to approach human communications because it allows different data types — video, graphics, sound and data — to be presented simultaneously.

Each element reinforces the others; together they form a powerful presentation. In addition, viewers can interact with the program, learning and responding to the presentation and receiving instant feedback through the capabilities of the computer and the random-access attributes of the videodisk player used as a computer peripheral. As a result of such interaction, people retain much more information than they do from other types of presentations.

Winning against the HP3000 isn't everything.

When we recently benchmarked the BTI8000 against HP's top-of-the-line Model 3000/68, we had cause to celebrate. Because the independently-audited test results proved we could outperform HP by more than three to one.

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Interactive video systems treat the images stored on a videodisk as a data type, which can be accessed and retrieved like any other data type. Such systems allow developers to call up video images in any order and to use any given image over and over in the same program. With interactive systems, developers can "grab" images, digitize them and manipulate them by computer for enhancement, sizing or positioning.

Overlay capability

Computer graphics images are created and stored separately from video images. The graphics can either be displayed independently or overlaid on the video image. The overlay capability is a powerful tool for annotating objects that the videodisk displays in full motion or still frame.

For example, a video image of a personal computer can be overlaid with a circle that highlights a function key and with text explaining what the key does. Developers can create a number of graphics for the same personal computer image. With the graphics, they can take a user step by step through a lesson on how the machine works.

Interactive systems are based on videodisks that store images in an analog format and allow these images to be called up by frame number on a random-access basis. (Videotapes, on the other hand, are accessed linearly and must be viewed from beginning to end.)

As a storage medium, videodisks are compact. One 12-in. disk can store up to one-half hour of video, 54,000 still frames (the equivalent of 700 slide carousels) or 1G byte of data. Yet for all their power, the disks are economical, costing only $10 to $20 per copy, compared with $40 or more for videotape. Videodisks also are durable, with a typical lifetime of 10 years.

Encoding text

Currently, videodisks are used to store video and audio information. However, disks that can encode text as well (those with the ability to store from 1K to 16K bytes per frame) are beginning to emerge; they should be widely available by the end of this year.

A disk encoded with text can serve both as an interactive training medium and as an interactive reference source that provides additional information about the subject being taught.

Videodisks with high storage densities will also provide sound-over-still capabilities. Telephone-quality sound (4K bit/sec.) will be digitally encoded using compressed audio techniques. Given that a disk can hold up to 1G byte of data, it will be able to store many hours of sound and have room left over for text and video. Digital sound-over-still technology should become available this year.

Further in the future is digitized video, which will let interactive video approach the capabilities of digital image processing. Systems that accommodate digitized video will allow users to zoom in for close-ups, enhance images and change colors.

About the author

Nathan Kaloyski is vice-president of marketing for Visage, Inc., a Natick, Mass., firm that manufactures interactive video systems.

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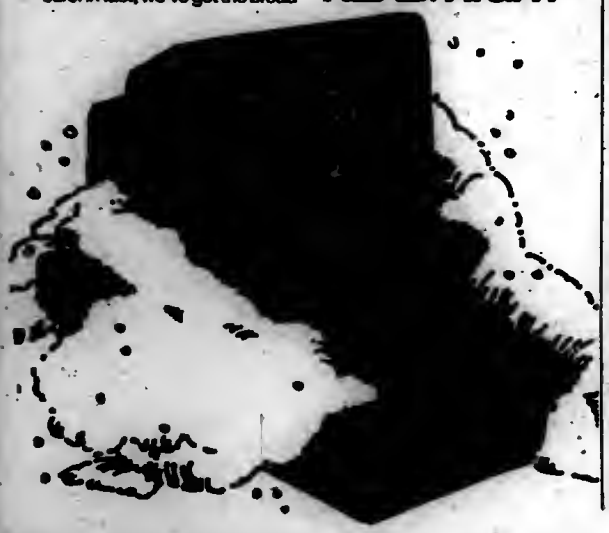

MICROCOMPUTERS

Sysgen update automates tape backup

FREMONT, Calif. — Sysgen, Inc. has introduced a software enhancement for two of its ¼-in. tape backup units that reportedly offers automatic backup of stand-alone personal computers.

The software reportedly enables users of personal computers with built-in clocks to schedule automatic backup when the machine is not in use. The software requires users of systems without built-in clocks to set the time when they boot the operating system.

Automatic backup is available on some local-area network servers, including the 3Server from 3Com Corp., but Sysgen said its automatic archival system for stand-alone units is a first. The automatic backup software was officially announced at the Comdex/Spring '85 trade show last week in Atlanta.

The automatic backup software will come bundled at no additional charge with Sysgen's 10M-byte Smart QIC-Pile, which

Sysgen Disc-Pile and QIC-Pile

costs $995, and 40M-byte Smart Image backup systems, which cost $1,395 and $1,495, respectively, in their internal and external versions. It will also be sold to existing users of those backup systems for a fee of about $25, Sysgen said. The software is scheduled to ship in June.

The package includes a menu-driven utility that lets users preselect files to be backed up, including subdirectories or only those files changed since the last backup. Two backups a day may be done, and, if the computer is in use at the time of a scheduled backup, users are reminded with a beep. Backup takes place automatically once they are finished. Sysgen

See SYSGEN page 92

Desq packages give IBM users multitasking

ATLANTA — Quarterdeck Office Systems, Inc. has introduced software said to permit multitasking of applications on the IBM Personal Computer. The firm also announced Desq 2.0, an enhanced version of Quarterdeck's Desq windowing software, which also supports multitasking.

The Desq-GT multitasking software package is targeted at spreadsheet users who want to have several applications files open at once, Quarterdeck said. Users reportedly can run such activities as printing or communications in a background mode while working on an application in the foreground. Consistent menu interfaces are provided for applications running under Desq GT, and more than 150 applications programs run without modification, Quarterdeck said.

The software reportedly supports bitmapped graphics. Also supported are several mouse systems and both monochrome,

See DESQ page 92

- Hayes Microcomputer Products announced a multifunction board for print and communications buffering/80
- Quadram unveiled a card to permit IBM Personal Computer-to-IBM minicomputer communications./82
- Innovative Software enhanced its Smart software series/82

INSIDE

Software/82
Systems/87
Communications/87
Storage/88

MICRO BITS
Thomas Madron

Is Topview worth the investment?

Topview, IBM's entry into the integrated software market, may be aimed at a market that is not there.

Like other integrating products, Topview allows users to access more than one applications program concurrently. However, the vendor claimed that Top-

See TOPVIEW page 80

IBM offers desktop printers

RYE BROOK, N.Y. — IBM recently introduced two desktop printers for its Personal Computers and some compatibles.

IBM's Color Jetprinter costs $745 and prints in seven colors, with ink stored in cartridges. It can produce output on 8½ by 11-in. transparencies, coated paper and bond paper, according to IBM.

The Color Jetprinter reportedly is all-points addressable and can generate graphics with a density of up to 9.6K dot/sq in. in a single pass and up to 19.2K dot/sq in. in double printing.

Text can be printed in any of four pitches, each with two speeds, IBM said. With a normal pitch of 10 char./in., near-letter-quality documents can be printed at up to 20 char./sec. and drafts at up to 33 char./sec.

With a condensed pitch of 16.7 char./in., near-letter-quality documents are generated at up to 30 char./sec. and drafts at up to 50 char./sec.

The IBM Proprinter, a dot matrix device, reportedly handles single-sheet paper, multipart forms or envelopes through a slot in front, while continuous-form paper can be fed from the top. The Proprinter costs $549.

The Proprinter can print drafts or data at up to 200 char./sec., reports at up to 100 char./sec. and near-letter-quality documents at up to 40 char./sec., according to IBM. The all-points-addressable device can produce as many as 17.3K dot/sq in.

IBM said both devices are available immediately.

More information is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

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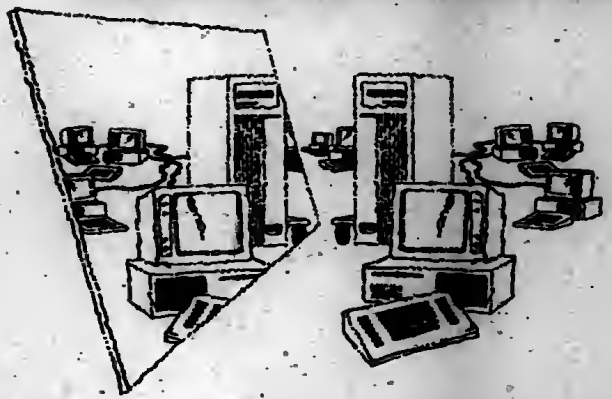

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Local Area Networks For Large Organizations

NESTAR

Hayes offers multifunction device

NORCROSS, Ga. — Hayes Microcomputer Products, Inc. has introduced Transet 1000, a multifunction device that offers print and communications buffering, I/O switching and port expansion.

The device, which costs $300, reportedly performs multiple tasks simultaneously, including sending or receiving data via a modem while sending output to a printer, and can act as a stand-alone 24-hour electronic mailbox.

Compatible with any device with an RS-232 port, Transet can handle data from a computer or high-speed modem at up to 19.2K bit/sec., Hayes said. Any communications software package providing terminal emulation can work with the equipment.

Xmodem protocol offered

Communications features reportedly include time-date stamping, overflow control and dynamic memory allocation. Mailbox functions also include a logon message and options for sending, scanning and printing mail. Transet also offers the Xmodem protocol, to insure data integrity and password features.

Print capabilities are said to include compression, pagination, automatic page numbering, format control, collated printing of multiple copies and time-dating.

Transet features 128K bytes of internal memory, divided into mailbox, buffer and replay segments.

The device also includes a Motorola, Inc. 68008 processor, software-controlled peripheral switching, two serial ports and a printer port, which supports both parallel and serial printers. The device permits a personal computer to send output to two printers or two personal computers to access a printer, Hayes noted. Specific configurations can be stored in electrically erasable programmable read-only memory, according to the company.

Transet is scheduled to ship late this month. Systems accessory kits, with utility disk and cable, for the IBM Personal Computer, Apple Computer, Inc. Macintosh and Apple IIc also will be sold, with pricing set by individual dealers, according to the vendor.

Hayes is headquartered at 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

Corporate micro users hold meet

NEW YORK — An organization for corporate users of personal computer local-area networks, formed here recently by network reseller LAN Services, Inc., held its first meeting on May 2.

Kicking off the meeting of the PC Network Users Group, chairwoman Laurie Antonelli of Merrill Lynch Capital Markets pointed to the need for networking standards.

She called for greater support from applications software vendors like Lotus Development Corp., saying that suppliers "must give in, at least on site licensing," to network user demands.

Antonelli also emphasized the requirement for multiuser network versions of single-user personal computer packages.

"The [personal computer] environment is fantastic; the products are great," but users need to be able to move the software to a network environment, she said.

About 50 users showed up at the meeting, which featured an overview of Novell, Inc. network products and plans from Harry Armstrong, Novell marketing vice-president.

The gathering was the first personal computer network users group meeting he had seen, Armstrong remarked. "I've been waiting for this meeting for about four years."

Monthly meetings are planned. The next meeting, scheduled for June 20, is expected to focus on communications servers. The group also intends to set up an electronic bulletin board for members, Antonelli said.

More information on the PC Network Users Group is available from Susan Freedman at LAN Services, Suite 701, 37 W. 57th St., New York, N.Y. 10019.

Compaq unveils Intel-based IBM chips

HOUSTON — Compaq Computer Corp. has introduced read-only memory Bios chips that make its Intel Corp. 8088- and 8086-based systems compatible with the IBM PC Network and the IBM Enhanced Graphics Adapter, the firm announced earlier this month.

The replacement firmware, scheduled for a mid-May delivery, can be installed by dealers. The costs are $30 for floppy disk drive systems and $40 for hard disk drive models, company officials said.

Compaq's Intel 80286-based systems, as shipped, are fully compatible with the two IBM standards, the company said.

More information is available from Compaq at 20555 FM 149, Houston, Texas 77070.

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Commodore World, is a monthly publication with a circulation of 22,000. Editorial targets the Commodore user with reports on all aspects of Commodore operations.

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Enhanced Smart series out

OVERLAND PARK, Kan. — Innovative Software, Inc. has enhanced the three programs in its Smart software series for the IBM Personal Computer. The enhancement reportedly includes asynchronous communications capability in each program.

Version 2.0 of Smart is said to incorporate a time manager and communications module into Smart word processing, spreadsheet with graphics and data base management programs. Each program is available separately or can be bundled into an integrated package.

Version 2.0 of the Smart Spreadsheet reportedly has been made faster by adding support for the Intel Corp. 8087 and Motorola, Inc. 68284 math coprocessors. The Smart Spreadsheet is said to support up to 8192 rows and 8,999 columns.

Version 2.0 of each Smart program is said to include the Smart Programming Language to set up customized projects. The programming language is composed of English-language commands such as IF, ELSE, ENDIF and CONTINUE and several debugging commands, the vendor said.

The communications module in each Smart program reportedly allows users to upload, download and transfer data unattended. Other features include automatic dial, answer and logon to remote data bases, electronic mail and capture to memory, file or printer. The communications module supports the standard Xon/Xoff protocol, Xmodem standard and emulation of Ansi terminals, according to the vendor.

Smart 2.0 word processing software costs $295; Smart Spreadsheet costs $395; and data base management software costs $495. The bundled system sells for $895. Each program runs on the IBM Personal Computer, Personal Computer XT and AT with a minimum of 256K bytes of memory and two floppy disk drives or a hard disk.

Innovative Software is located at Suite 380, 9300 W. 110th St., Overland Park, Kan. 66210.

Quadram unveils adapter for IBM Personal Computers

NORCROSS, Ga. — Quadram Corp. has announced an adapter card that is said to allow IBM Personal Computers, including the Personal Computer AT, XT and Portable Personal Computer, to emulate IBM workstations in IBM System/34, 36 and 38 minicomputer environments.

The Quad 5251 card reportedly allows the micros to emulate IBM 5251 Model 11, IBM 5291 and IBM 5292 workstations. The card attaches the micro directly to the mini's twin-axial cable, which eliminates the need for modems in the host.

The emulation board reportedly permits concurrent switching between micro and mini sessions with a single keystroke and features a user-configurable display station. The product is said to support IBM Virtual Diskette file transfer software and transfer to disk storage, screen print and color or monochrome displays.

The Quad 5251 is said to be compatible with IBM 5250 emulation software and hardware. It requires IBM's PC-DOS 1.1 or 2.0 operating system and 128K bytes of memory.

The product costs $895.

Quadram is located at 4355 International Blvd., Norcross, Ga. 30093.

SOFTWARE

■ Datasystems Software Corp. has announced the enhancement of its Entrymanager, software for remote job entry using personal computers under AT&T's Unix, IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating systems.

Formerly known as Datamanager, the software now reportedly supports the Unix System V operating system and features an expanded data base. That data base has the capacity for 256 record types and allows 256 fields per record.

The software operates on a network to provide for intelligent data entry and distributed data processing, the vendor said. It offers input validation at the character, field and form levels.

Entrymanager costs $695.

Datasystems Software, 7301 Topanga Canyon Blvd., Canoga Park, Calif. 91303.

■ McGraw-Hill Training Systems has introduced its Fastestart Tutorial Series, software for the IBM Personal Computer that reportedly teach users how to use either Lotus Development Corp.'s 1-2-3 or IBM's PC-DOS 2.0.

Topics covered in the tutorials are said to range from beginning concepts to advanced functions. The tutorials include menus and run simultaneously with the application, a system which lets learning exercises become templates for future use.

The PC-DOS version requires 128K bytes of memory, and the 1-2-3 version requires 256K bytes of memory.

The 1-2-3 version costs $79.95. The PC-DOS version costs $50.95.

McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif. 92014.

See MDS page 83

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Check it out. You'll see a screen that's 2" bigger than TeleVideo's, an 80/132 column format instead of their 80, and 16 programmable function keys compared to 3 or 11 on TeleVideo's 914 or 950. You'll see Wyse doesn't

*Wyse 50 is a trademark of Wyse Technology TeleVideo 914, 924, 925 and 950 are trademarks of TeleVideo Systems Inc.

MICROCOMPUTERS

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■ Alloy Computer Products, Inc. has announced enhancement of its Formula/One software with the inclusion of a utility that reportedly lets the software exchange data with Lotus Development Corp.'s 1-2-3.

The utility is said to allow data to be transferred from 1-2-3 into Formula/One, an equation-solving package for forecasting and time-series trend analysis. Formula/One runs on the IBM Personal Computer line, including the Personal Computer AT.

The utility reportedly includes a windowing feature that allows users to view both 1-2-3 and Formula/One on-screen simultaneously while exchanging data.

The utility will be supplied free to current users of Formula/One. With the utility included, Formula/One remains priced at $695.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ Richfield Software Corp. has introduced Ride, a programming language for business applications. It runs on the IBM Personal Computer under Microsoft Corp.'s Xenix and MS-DOS operating systems.

Ride supports all C statements except GOTO. It includes such built-in functions as data conversion, string manipulation, I/O, form input, data base access, screen handling, report generation and mathematical operations.

Ride costs $295.

Richfield Software, 2060 Valmont Road, Boulder, Colo. 80301.

■ Rio Grande Software, Inc. has introduced RGS Softmaker II, data base management software for the Apple Computer, Inc. Macintosh personal computer.

The software is said to be menu driven and to provide such utilities as deletion, mass deletion, merging, sorting and renaming of files. It also features on-line help and password protection on data and structural files and for screens, according to the vendor.

It also reportedly includes formula definition for customized reports. RGS Softmaker II will automatically total all numeric columns with 14-digit accuracy, RGS said.

The package is priced at $190, according to the vendor.

Rio Grande Software, P.O. Box 5906, 221 Nolana, McAllen, Texas 78504.

■ National Data Processing Corp. has introduced DataEntry, software for batch data entry on the IBM Personal Computer.

Written in the C language, the software reportedly includes record insertion, backward and forward scrolling, format linking and automatic format selection. The system requires relabeling of about 46 keys with key labels supplied in the package.

The software is said without a file transfer utility. It costs $600 for the first machine and $200 for each additional machine.

National Data Processing, P.O. Box 5203, Wilmington, N.C. 28406.

■ General Electric's Automation Controls Department has introduced factory simulation software for IBM Personal Computers and compatible machines, including IBM's Workmaster industrial portable computer built for General Electric.

Modelmaster is said to give the user representations of actual factory floor layouts and includes icons of factory equipment such as robots.

The product reportedly allows users to design a plant or assembly line, and select production machines to be used in the simulation. Users can design the factory floor and select the amount of production time the simulation represents. Users then can observe bottlenecks in material flow and make appropriate corrections.

Modelmaster is priced at $6,800 and will be available in the third quarter.

General Electric Automation Controls Department, P.O. Box 8106, Charlottesville, Va. 22906.

■ Honeywell, Inc. has announced Microsystem VIP Emulation asynchronous terminal emulation software.

The product reportedly allows the Honeywell Microsystem Personal Computer, IBM Personal Computer and Personal Computer XT to communicate directly with Honeywell DPS 6 minis and DPS 8 and Multics mainframes by emulating Honeywell terminals.

The software is said to emulate all Honeywell asynchronous VIP7300 and VIP7800 series terminals. The previously released PC7300 emulates only the VIP7205 terminal for office automation applications, and the PC7800 emulates only the VIP7801 terminal.

Microsystem VIP Emulation can reportedly be used with Honeywell's office automation, transaction processing, query and file transfer applications on DPS 6 systems and with Honeywell Solution Center programs on DPS 8 mainframes.

The software costs $400.

Honeywell, 200 Smith St., Waltham, Mass. 02154.

See AIDS page 95

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AIDS from page 83

■ Scientific Computing Associates has introduced a version of its SCA Statistical System for the IBM Personal Computer line.

The software is said to be an integrated system offering interactive and compatible batch processing modes. Its capabilities include data manipulation and general statistical analysis.

The Personal Computer version of the tool reportedly lacks the vector capability of the mainframe version.

A hard disk and a minimum of 512K bytes of memory is required.

The software costs $595.

Scientific Computing Associates, P.O. Box 625, De Kalb, Ill. 60115.

■ Macmillan Software Co. has introduced its Asyst software, said to permit machines in the IBM Personal Computer line to function as scientific workstations.

Asyst software reportedly uses the Personal Computer's optional Intel Corp. 8087 coprocessor to offer 80-bit internal precision for computational accuracy. An integrated package, it also is said to enable users to perform data analysis, data acquisition and graphics.

The entire Asyst package is priced at $1,695. Modules within the package are priced from $495 to $795.

Macmillan Software, 866 Third Ave., New York, N.Y. 10022.

■ QCX Corp. has announced a Cobol applications generator for the IBM Personal Computer, Personal Computer XT and AT.

Fastec software is said to combine elements of Cobol with screen generation, report generation and relational data base management. The product reportedly generates self-documenting and modifiable Micro Focus, Inc.-compiled Level II Cobol programs for menu screens, file update screens, inquiry screens, reports and file extracts.

Fastec requires the QCX or Micro Focus Level II Cobol compiler and a 256K-byte hard-disk system. Generated applications can be run separately on a 128K-byte floppy disk-based system.

QCX, 261 Circle Court, Palatine, Ill. 60067.

■ Micro Data Base Systems, Inc. has introduced its Menu Maker software for the creation of menus on the IBM Personal Computer.

Menu Maker reportedly can be used to execute commands used by IBM's PC-DOS operating sytem or to invoke off-the-shelf programs among other tasks.

Menu Maker reportedly traverses directories.

Menu Maker can support an unlimited number of menu levels and is priced at $195. It is available for PC-DOS 2.0 or later versions.

Micro Data Base Systems, P.O. Box 248, Lafayette, Ind. 47902.

■ Haen, Inc. unveiled Haen-DSS, a menu-driven decision support system for the IBM Personal Computer.

Haen-DSS reportedly does not require a command language for use. Instead, users can choose among on-screen options and make selections using either a mouse or key. They may also simultaneously choose data from a large number of independent sources, treating them as a single data base.

The software requires 256K bytes of memory and IBM's PC-DOS 2.0 or later. It is priced at $2,000 per Personal Computer. A mainframe link, Haen-MFL, costs $40,000 per mainframe site.

Haen, Suite 650, 312 W. Randolph St., Chicago, Ill. 60606.

■ Sysgen, Inc. has announced enhancements to the software in its streaming tape backup subsystem. The software reportedly supports IBM's PC-DOS Version 3.0 on the IBM Personal Computer line.

Sysgen Image Release 3.01 is said to allow users to perform image as well as file-by-file backup of hard disks exceeding 10M bytes of storage capacity. The release remains compatible with the earlier 3.0 and 2.1 versions of PC-DOS and MS-DOS.

Release 3.01 reportedly offers improved error detection.

The product costs $35.

Sysgen, 47853 Warm Springs Blvd., Fremont, Calif. 94539.

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NEW ELECTROHOME EDP-58

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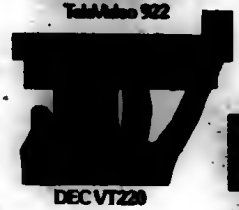
TeleVideo corrects the VT220 key mistakes.

The new TeleVideo® 922 shares but one feature with the VT220*: DEC*-compatibility. The similarity ends there.

TeleVideo 922



DEC VT220

1. Take our keyboard, for example. The RETURN key is within direct, easy reach. But VT220 users must stretch over an additional key to hit RETURN. Or have the hands of a concert pianist.

Here's ours.

Where's the VT220 ESCAPE key?

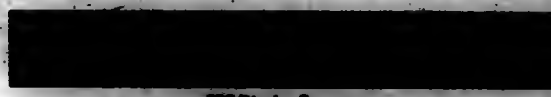
2. Our ESCAPE key is located above the TAB key, right where you'd expect to find it.

Theirs isn't.

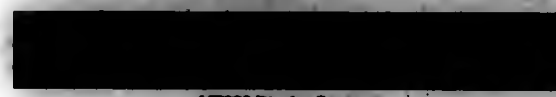
In fact, you have to go hunt for the VT220 ESCAPE key halfway across the row of function keys.

3. Take a look below at the 922 keyboard. That's a true accounting keypad, complete with a Clear Entry, Double Zero and a TAB key. Not merely the numeric keys you get with the VT220.

4. Our SHIFT key is exactly where it should be, so it does exactly what it should do—shift. Their SHIFT key is shoved over by the < and > key to create lots of < and > on the CRT. Of course with a little practice, you could relearn their keyboard. But why, now that you've seen our 922?



922 Display Screen.



VT220 Display Screen.

5. And after we built a better keyboard, we built a better terminal. With exceptional reliability. Quality. Advanced ergonomics. Everything you'd expect from the industry ANSI leader.

The new 922 is available now and priced to move now. And it's backed by a worldwide sales and support network.

6. Here are 5 more advantages to the 922.

	TeleVideo 922	DEC VT220
Programmable Function Keys	15 (30 with shift)	15 (shifted only)
True Accountant Keypad	YES	NO
Plug-in Graphics Upgrade Option	YES	NO
Full Tilt & Swivel	YES	NO
Enhanced ANSI Mode	YES	NO

*DEC, VT220 are registered trademarks of Digital Equipment Corporation

800-538-8725.
In California, call 408-745-7760.

The TeleVideo 922

©TeleVideo Systems, Inc.

"Now $799"

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■ National Semiconductor Datachecker/DTS Corp. has announced Posicom, communications software linking the company's controller-based and terminal-based point-of-sale scanning systems with its Datachecker/DTS 600 Store Computer, an IBM Personal Computer XT compatible.

With this connection, store managers can apply point-of-sale data to a variety of spreadsheet and data management packages, according to a spokesman. Supermarket managers can plug a 600 Store Computer into a Datachecker 1600 or 1700 controller to access point-of-sale information and host data.

The software converts data to the standard personal computer format, Comma Separated Values. When used in conjunction with Datachecker/DTS terminals, Posicom requires the company's Terminal Network System (TNS) communications board and software developed by Datachecker/DTS for the 600.

Posicom is available at no charge with the purchase of a model 611 or 621 Storage Computer or TNS. Prices for the 611 and 621, including TNS, are $4,000 and $4,600, respectively. TNS separately costs $1,895.

National Semiconductor Datachecker/DTS, 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

SYSTEMS

■ Project Software & Development, Inc. has announced Maximo Maintenance Manager, a turnkey factory maintenance system based on an IBM Personal Computer AT.

A vendor spokesman said that the package assists in work-order tracking, equipment history and inventory control. Maximo allows a user to associate each work order with craft, crew and spare part requirements. According to the vendor, requisitions are automatically generated from a job plan and closed against an inventory control system.

The product features an IBM Personal Computer AT with IBM's PC-DOS, a 20M-byte hard disk drive, 512K bytes of random-access memory and a color monitor as well as a mouse.

Maximo costs $35,000.

Project Software & Development, 20 University Road, Cambridge, Mass. 02138.

■ Action Instruments, Inc. has announced BC-10, an IBM Personal Computer-compatible microcomputer that works with bubble memory cards rather than disk drives. The product is designed for factory automation, process control and field-test applications.

BC-10 features an Intel Corp. 8088 microprocessor, an optional 8087 microprocessor and 256K bytes of random-access memory. In place of disk drives, the machine supplies plug-in bubble memory cards. Each card holds between 128K and 512K bytes of memory, and four cards can be loaded into the machine.

BC-10, available in 19-in. rack or wall-mounted configurations, costs $2,295, excluding monitor and keyboard.

Action Instruments, 8601 Aero Drive, San Diego, Calif. 92123.

COMMUNICATIONS

■ Prentice Corp. has begun bundling Softwyze Publishing Corp.'s PFS:Access communication software with Prentice's Popcom C150 and Popcom X150 modems.

The modems, which run on an IBM Personal Computer with IBM's PC-DOS operating system, operate at speeds of either 300 or 1,200 bit/sec. They are full-duplex, offer compatibility with Hayes Microcomputer Products, Inc. and AT&T Bell Laboratories 212A modems and include automatic dialing and answering functions, the vendor said.

The Popcom modems give access to a number of on-line data base services, including Source Telecomputing Corp.'s Source and Dow Jones & Co.'s Dow Jones News Retrieval Service, the vendor said.

Popcom X150, an external modem, costs $499.

Popcom C150, an internal modem, sells for $469.

Prentice, P.O. Box 3544, 365 Caplan Drive, Sunnyvale, Calif. 94088.

■ Network Software Associates, Inc. has announced an enhanced version of its Adapt SNA RJE emulator software that allows IBM microcomputers emulating an IBM 3770 or 3780 RJE workstation to operate in unattended mode at a remote location.

Adapt SNA RJE/UOF is said to be a programmable interface with a control flow exit facility for the IBM Personal Computer, Personal Computer XT or AT. The product enables a user-customized micro program to examine every message sent by the host and to send an appropriate command to the emulator or host before returning control to the emulator.

The UOF version can reportedly be used in Cobol, C, Basic or assembly language. It requires IBM's standard Synchronous Data Link Control adapter card, PC-DOS version 2.0 or higher, and 192K bytes of memory.

The Adapt SNA RJE emulator enhanced by UOF costs $670. The UOF upgrade for current RJE emulator users sells for $295.

Network Software Associates, 19401 Sierra Soto, Irvine, Calif. 92715.

■ Communications software featuring script language for performing unattended communications has been announced by VM Personal Continued on page 88

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UNIX Fundamentals for Non-Programmers	Apr 15-17 June 17-19 Aug 12-14 Oct 14-16 Dec 9-11	Jun 16-18 May 28-31 Oct 8-4	Mar 20-22 July 31 Aug 2 Dec 16-20	Jan 16-18 Mar 20-22 May 29-31 July 31- Aug 2 Oct 2-4 Dec 18-20	Feb 20-22 June 19-21 Oct 16-18	Mar 13-15 Aug 21-23	Feb 20-22 June 19-21 Oct 16-18	Mar 13-15 Aug 21-23	$735	$735
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UNIX Administration*	May 13-17 July 15-17 Sept 16-20 Nov 11-13	Feb 18-21 July 8-11 Nov 19-21	May 7-9 Sep 10-12	Feb 18-21 May 7-9 July 8-11 Sep 10-12 Nov 19-21	Mar 26-29 July 30- Aug 1 Dec 16-12	May 21-23 Oct 1-3	Feb 12-14 Mar 26-29 July 30- Aug 1 Dec 16-12	May 21-23 Oct 1-3	$735	$735
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Continued from page 87
al Computing, Inc. (VMPC).

The Relay Gold software, which also runs on the Data General Corp. DG/One and Wang Professional Computer, can provide micro-to-mainframe communications, including cooperative processing, according to the vendor. Working with VMPC's Relay/3270 on the mainframe, Relay Gold provides IBM 3270 terminal emulation and error-free file transfers.

The software is said to be useful for the development of expert applications, under which executives can access Dow Jones News Retrieval, a product of Dow Jones & Co, or electronic mail services. The software also supports the AT&T 2224B and Hayes Computer Products, Inc. 2400 modems and others.

Relay Gold costs $225 and will begin shipment July 1.

VMPC is located at 6 Germantown Road, Danbury, Conn. 06810.

■ Telesystems, Inc. has released Telesystem X, a communications software package designed for Tandy Corp. Model TRS-80/16 microcomputers running Microsoft Corp.'s Xenix operating system.

The product supports the Xmodem protocol and is supplied with file transfer capabilities, according to the vendor. The software is equipped with automatic dialing and logon procedures and a print feature that supplies the ability to spool output to a printer or a disk file.

Telesystem X works with modems from Hayes Microcomputer Products, Inc. and Tandy, a spokesman said.

The software includes a modem table that allows a user to set modem parameters. In addition, the package works with protocol converters from a number of manufacturers, including Avatar Technologies, Inc.

Telesystem X costs $395.

Telesystems, P.O. Box 217, Willingboro, N.J. 08046.

STORAGE

■ Miniscribe Corp. has announced two 3½-in. microcomputer Winchester disk drives.

The two-disk Model 8425 reportedly provides 25.6M bytes of storage, and the single-disk Model 8212 provides 12.8M bytes of capacity. Both products are said to use thin film media and incorporate the industry standard ST412 interface. Mounting requirements for both are reportedly identical to those for 3½-in. floppy disk drives.

Both models are said to feature average power consumption of 9.7W, an average access time of 68 msec and a data transfer rate of 5M bit/sec.

The Model 8425 is priced at $600, and the Model 8212 is priced at $450.

Miniscribe, 1861 Lefthand Circle, Longmont, Colo. 80501.

■ Corvus Systems, Inc. has introduced a combination fixed disk drive and tape backup unit for the IBM Personal Computer.

The Corvus Trimline Combo reportedly offers 20M bytes of formatted disk storage and either 45M bytes or 60M bytes of tape backup. It fits under the Personal Computer's monitor.

All of the unit's backup options, including the setting of defaults, reportedly are presented in menu form. Using the unit, a disk can be backed up completely or on a file-by-file basis. A directory of backup files is provided at the beginning of every tape.

The Trimline Combo costs $3,295.

Corvus Systems, 2100 Corvus Drive, San Jose, Calif. 95124.

■ Tecmar, Inc. has announced the AT HD disk drive and QIC-60 AT tape backup unit for the IBM Personal Computer AT.

The AT HD is a 20M-byte Winchester hard disk drive with an average access time reported to be 45 msec. It is designed for internal installation.

The QIC-60 AT is an internal streaming tape backup unit that is capable of copying 20M bytes of data in four minutes. The product can copy an entire hard disk or selectively copy individual files, according to the vendor.

The AT HD is priced at $1,595, and the QIC-60 AT sells for $1,095.

Tecmar, 6225 Cochran Road, Solon, Ohio 44139.

■ PC's Ltd. has announced four external hard disks for the IBM Personal Computer, all including a controller linking them to the micro.

The disks are available in 10M-, 20M-, 33M- and 42M-byte versions.

The 10M-byte hard disk costs $749 or $1,344 with tape backup. The 20M-byte version sells for $895 or $1,490 with backup. The 33M-byte disk costs $1,495, and the 42M-byte disk costs $1,695. The tape backup purchased separately costs $795.

PC's, 7801 N. Lamar, E-200, Austin, Texas 78752.

■ Teledyne Technology, Inc. has introduced its Packetape 67M-byte archival storage system for the IBM Personal Computer AT and XT.

The storage system uses a ¼-in. data cartridge subsystem incorporating a half-slot interface. It reportedly provides on-the-fly error detection and correction.

The Packetape unit reportedly appears to the IBM unit as four 16.75M-byte diskette drives. All files are randomly accessible on-line using standard PC-DOS commands, according to the vendor.

The Packetape unit is priced at $2,990.

Teledyne Technology, 270 E. Palisade Road, Greenlawn, N.Y. 11740.

See STORAGE page 92

HOW TO SURVIVE TOO MUCH OF A GOOD THING.

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4900 Old Ironsides Drive, M/S 628, Santa Clara, CA 95054

TOPVIEW (continued from page 79)

view provides a truly convenient operating environment in that multiple applications can all run at the same time, while some other products simply step and restart several applications as a user moves from one to another.

Thus, at its best, Topview can be viewed as an extension to the operating system. Once installed, it allows users to move with ease from one application to another.

This article was written on Micropro International Corp.'s Wordstar running under Topview, with Microstuf, Inc.'s Crosstalk XVI running concurrently, connected to a mainframe system. All of these packages were running on a Tandy Corp. 1200 HD, an IBM Personal Computer XT clone, which substantiates the claim that third-party software support will flourish from numerous competitors.

From a user's perspective, Topview works mostly as advertised. A pointing device, either a mouse or the cursor keys, is used to make selections from menus that appear in a window. Various applications can be seen concurrently from different windows provided they do not require a full screen display themselves. Windowing is essentially not available for Wordstar or Crosstalk XVI, at least without modification.

The program seems a bit sluggish in moving from one application to another but not irritatingly so.

It is difficult to say precisely what is involved in moving from one application to another but not irritatingly so.

In addition to the pointing device, only three keys are necessary used to control Topview: the 7-Home, 9-Pgup and Alt keys. When inside an application, Topview is signaled by pressing the Alt key. At that point, a menu pops up that allows users to change from one program to another or to start another application. When a procedure fails to run or continued, the 7-Home key is pressed. This 9-Pgup-Alt-Home escape from the menus without confirming a procedure.

During the installation procedure, however, it became clear that some programs would not work at all, while others were far more difficult to use from Topview than directly from MS-DOS. Moreover, Topview does not support some facilities, such as batch files or a B drive on a Personal Computer XT.

But I have a larger problem with products like Topview: While they may assist productivity once the learning curve has been overcome, I'm not convinced that the productivity improvement will subsequently compensate an organization for the cost of installing such products.

Let's estimate two hours of training and two hours of total installation time for Topview. We'll also assume an installation with 100 personal computers and an average personnel cost of $12 an hour, although that is on the low side for many organizations.

We have the following costs: $14,900 for original purchase of 100 copies at $149 per copy; $2,400 for training time and $2,400 for installation costs. That's a total cost of $19,700 for 100 workstations.

Depending on how we amortize all this, we will need an average productivity improvement of $197 per employee to break even. This probably must be ascertined within a year, since the configurations, number of personal computers in the organization and related issues will all be changing and growing during the year. I suspect that an organization that invests in a product like Topview will not recover its costs.

Moreover, employees who have already learned how to use MS-DOS and appropriate applications will likely not use the product, and new users remain new users only for a short period of time. These are some of the reasons why similar products have had only mediocre sales.

In a large organization with a substantial network, a significant amount of network performance data can be gathered only at the end user's terminal. A multitasking system that would allow such data to be recorded, saved and later transmitted to a central collection site would be invaluable.

True multitasking operating systems, like Digital Research, Inc.'s Concurrent PC-DOS or the upcoming MS-DOS 4.0, may be a better choice for such tasks than overlays like Topview.

Madron is manager of computer services at North Texas State University, Denton, Texas.

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"And a lot of advice. Tilt your head to quit feeling crossed with it!"

STORE from page 86

■ California Computer Group, Inc. has announced Filestor, a 60M-byte direct-drive cartridge streamer storage system for the IBM Personal Computer AT and XT.

The product is said to be capable of a 150-msec start/stop time and a streaming transfer rate of 3.75M byte/min. Filestor reportedly offers a stationary head and motor design that is said to reduce alignment problems and wear on the drive.

Filestor allows users to back up individual files or the entire hard disk, according to the vendor. The drive fits into a half-height floppy space in the micro and requires one expansion slot for its tape controller.

Filestor costs $1,295.

California Computer Group, Suite G.10, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

■ Scientific Micro Systems, Inc. (SMS) has released two storage subsystems that boost storage capacities for microcomputer systems with Intel Corp. Multibus backplanes and with Small Computer Systems Interface (SCSI) ports.

The SMS 8000 Model 60 is said to provide added storage for the SMS 8000 Model 40 microcomputer system as well as Multibus-backplane systems from other vendors. It employs SMS' FWD 8000 controller, which supports 5¼-in. Winchester disks and both 8-in. and 5¼-in. floppy disks.

The SMS 5000 Model 60 is said to serve as added storage for systems equipped with an SCSI port. This version includes SMS' Omti 5000 series controller that supports 5¼-in. Winchesters, both 8-in. and 5¼-in. floppy disks and streaming tape.

The SMS 8000 Model 60 with an 8-in. floppy drive and a 10M-byte Winchester disk drive costs $5,000. The same system with a 5¼-in. floppy and 10M-byte Winchester is $4,900; with a 5¼-in. floppy and 20MB-byte Winchester, it costs $14,000.

The SMS 8000 Model 60 costs $4,100 with a 5¼-in. drive and 10M-byte Winchester disk drive. That model, with a 5¼-in. floppy and 20MB-byte Winchester, costs $13,000.

Scientific Micro Systems, 339 N. Bernardo Ave., Mountain View, Calif. 94043.

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The TC-500A can handle an aggregate input of up to 307,200 bps with 32 channels operating at 9600 bps. It provides error correction, network monitoring and diagnostics, and achieves exceptionally fast response times even under heavy loads.

The TC-500A is available with 4800 or 9600 bps integral modems and synchronous capability. Additional channel capacity can be installed in the field to allow convenient network expansion. ComDesign's unique modular firmware scheme provides easy access to available options and the latest operating software.

Bring *YOUR* data communications network up to speed with the power and flexibility of the TC-500A. To find out more, call ComDesign toll-free (800) 235-6635 or in California (800) 368-8092. TWX 910-324-1180.

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DESQ from page 79

and color monitors, Quarterdeck said.

Desq-GT is said to be compatible with program interface files, which are being provided by IBM and independent developers to make programs work easily under IBM's Topview operating environment. Unlike Topview, however, Desq-GT supports both keyboard and mouse commands interchangeably, allows the use of batch files and supports virtual memory, Quarterdeck said.

Desq 2.0 is said to incorporate bit-mapped graphics support along with multitasking. Like Desq-GT it is compatible with IBM's program interface files.

Both products will be available in July. Desq 2.0 costs $199.95, and Desq-GT is $99.95.

Quarterdeck Office Systems is located at 1918 Main St., Santa Monica, Calif.

SYSGEN from page 79

President Richard Tam said that another of the software's features is the ability to sense that a new tape cartridge is in use, a feature that he said prevents users from swapping cartridges and getting data mixed up. The software, he said, also can verify that the proper files were backed up and create directories of tapes and already-archived files.

Sysgen also announced enhanced software for the Sysgen Image tape subsystem and a combined hard disk/streaming tape subsystem for the IBM Personal Computer XT.

The software, Release 3.01, reportedly will support IBM's PC-DOS 3.0 and allow users to perform image and file-by-file backups of hard disks larger than 10M bytes. The Sysgen XT-Extra subsystem combines a 10M-byte hard disk with a 20M-byte tape backup unit in a system that uses the XT's disk controller and power supply.

Existing Sysgen Image users may upgrade to the release for $25; the XT-Extra is priced at $1,395 and will be available in June.

Sysgen is located at 47953 Warm Springs Blvd., Fremont, Calif. 94539.

COMMUNICATIONS

DATA STREAMS
Paul Korzeniowski
CW Senior Writer

AT&T having trouble in computer market

The transformation from a large monopoly to a diversified conglomerate is proving to be difficult for AT&T. Sixteen months after divestiture, the telephone company remains a relatively insignificant player in the computer game.

Last year, the company released two hardware lines. Its line of 3B minicomputers, released in spring of 1984, had been developed and used by AT&T and its operating companies for a number of years. So far, sales of the 3B have been slow and have been targeted mostly at regional operating companies.

AT&T's 6300 Personal Computer, introduced in June 1984, marked AT&T's entry into the microcomputer market. After roughly a year, the product's 1% market share rivals that of Columbia Data Products, Inc. and that of Televideo Systems, Inc., and is well below that of companies like Compaq Computer Corp. and Kaypro Corp., according to Infocorp, a Cupertino, Calif., market research firm.

One can argue that initial market expectations were unrealistic. Yet, even AT&T has admitted that its performance last year was not as good as expected. There are a number of reasons why the communications giant has experienced trouble selling processor hardware.

For one, the company did not have sufficient time to develop complete product lines. The 3B line was pushed out the door onto the market primarily because it was the only box AT&T had to sell. (The 6300 Personal Computer was designed by Olivetti Corp., and AT&T merely placed its label on the product.)

Another problem was that the company had to build distribution channels and a computer sales force. Retailers were slow to add

See AT&T page 100

STORY TIP/DANIEL MINOLI

Network models inadequate?

Standard network optimization methods, with their inherent assumptions, can grossly misrepresent actual needs, as outlined in a previous column [CW, May 6]. The use of a cookbook formula approach to network design can, in some cases, indicate the need for twice as many tie line trunks than are actually needed, requiring added expense.

Additional pathologies of standard networking models that designers should be aware of while trying to optimize networks include the following:

■ Standard optimization models assume that networks exist in a steady state. This means the model used to determine the network facilities needed assumes that users generate traffic that is stable in reference to time. In reality, traffic rates and parameters change almost continuously throughout the day.

Because communications traffic never reaches a steady state, the optimization model used may inaccurately indicate the facilities required. To compensate for this, users can adopt a more sophisticated model or at least factor this element into their network design.

■ Communications traffic is autocorrelated — related to itself — whereas network models presume all

See MINOLI page 101

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

Net managers automating

Survey says 28% growth expected over five years

BOSTON — Network managers are turning to automated tools to help monitor increased network usage.

That finding came from a joint survey conducted by Seattle-based Comm+ Systems, Inc., a nonregulated subsidiary of Pacific Northwest Bell Telephone Co., and CW Conference Management Group of Framingham, Mass., at the Network Management Technical Control conference held here last month. The survey included 110 managers representing approximately 15% of the conference attendees.

The managers projected that their networks would grow by 28% per year for the next five years.

More than half of the managers (52%) stated that their network management tools were at least partially automated, using a control terminal to monitor equipment. One quarter of the systems are manual and 23% are completely automated.

Approximately 80% of the managers were considering automating functions. The desired functions mentioned included performance reports, which were cited by conference attendees 61% of the time; management reports (58%); problem isolation (54%); color graphics displays (54%); and on-line network controls (49%).

Downtime was named by 40% of the respondents as their major problem area. Other problems attendees cited, in

See SURVEY page 100

■ DG and Equatorial Communications have formed a joint marketing pact that will integrate Equatorial's satellite net products with DG hardware and software/96

■ United Technologies has introduced a digital voice/data PBX that supports 40 to 200 voice/data lines/96

■ ETI has announced a package that enables users to determine communications costs using the new AT&T private-line tariffs/96

Canadian firms seek legal communications bypass

By Brian Banks
Special to CW2

In Canada, communications bypass is illegal, but many large Canadian firms are developing bypass strategies so that, in the event it is legalized, they can implement the systems quickly.

The motive for bypass — the use of any one of several technologies to step around telephone company facilities for voice/data communications — is generally economic. But bypass also offers users an added element of control over telecommunications destinies, a cherished commodity in such a dynamic environment.

Banks is the assistant editor of Computer World Canada, a subsidiary of Computerworld with headquarters in Mississauga, Ont.

Large-volume business telecommunications users who see bypass as a medium for potential savings are beginning to press for its legalization. And the growing presence of CNCP Telecommunications as an alternative to the telephone companies is reinforcing their position. According to Hudson Janisch, a University of Toronto law professor who specializes in telecommunications, "The bypass issue is alive and well in Canada."

The latest indication that bypass is on a lot of minds here was the recent announcement by Jean de Grandpre, Bell Canada Enterprises, Inc.'s chairman, that Bell Canada was contemplating a billing-by-the-bit rate structure for data transmissions.

On the surface, the connection between this possible move by Bell Can-

See CANADA page 101

Nynex ushers in Pathways family for Centrex service

NEW YORK — Nynex Corp. said it will offer a family of advanced network services called Pathways through the New York and New England Telephone companies.

The five services underline Nynex's commitment to maintaining the viability of its Centrex offering by adding software enhancements.

The five services available in 1985 are the following:

■ The Infopath packet-switching service, which allows users to access other computers, remote interactive data bases and interexchange carriers without performing conversions.

■ The Flexpath digital private branch exchange service, which will provide direct inward/outward dialing, perform analog-to-digital conversion at a rate of 1.54M bit/sec. and allow customer control over circuits.

■ The Switchway switched 56K bit/sec. service, which will be charged on a usage basis as opposed to a private-line rate and will use a standard two-wire local loop connection to the network.

■ Intellipath digital Centrex service, which will offer direct inward dialing, automatic route selection, trunk queuing, tandem networking, call distribution, customer station rearrangement and traffic information.

■ Quickway digital service, a digital point-to-point, point-to-multipoint full-duplex data transmission at 2,400, 4.8K, 9.6K and 56K bit/sec. speeds.

Nynex said it intends to add a Virtual Network Service as an alternative to private-line and special service circuits that will enable all traffic to be routed on the public switched net-

See NYNEX page 100

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To meet the varied needs of your end users, you don't need more software. You simply need the one software that does more. Symphony™ from Lotus.®

With Symphony users get a comprehensive software program with five basic functions—spreadsheet, database management, graphics, word processing and communications. These five functions can be used alone, together or in any combination. And with Symphony, users can start with one function and grow into others as their needs change.

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Symphony's unique open-ended architecture allows you to expand the functionality of the basic program with Add-In products. These Add-Ins work like Symphony—and with Symphony—so users don't have to learn a new language. Spelling Checker and Text Outliner are already available. And a variety of future Add-Ins and industry specific applications are now being designed by Lotus and qualified third-party developers to further enhance Symphony's capabilities.

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Our micro-to-mainframe link will tie Symphony to your existing environment.

Later this year, Lotus will introduce a new micro-to-mainframe Add-In product. Developed jointly by Lotus and DCA, this new link will allow designated PC users to transfer data to and from your mainframe computer. Mainframe data will be available on their PC spreadsheets in useable form, eliminating the need for retyping.

If your corporate environment already includes 1-2-3™, Symphony makes an even easier fit. It has a familiar user interface and reads 1-2-3 data.

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For more information on Symphony Software, contact your Lotus Marketing Representative or local authorized Lotus dealer.

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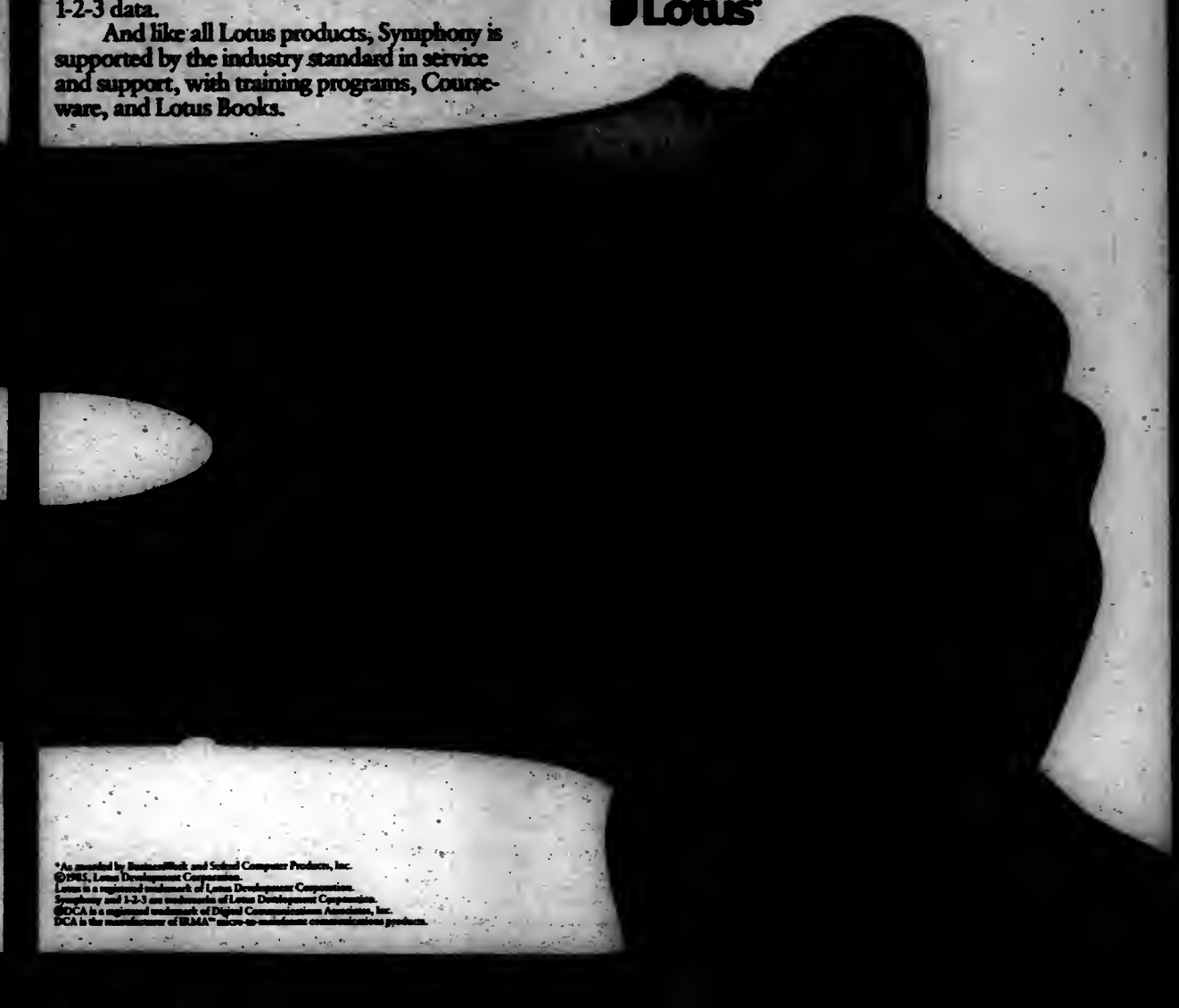

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®DCA is a registered trademark of Digital Communications Associates, Inc.
DCA is the manufacturer of IRMA™ micro-to-mainframe communications products.

DG, Equatorial join forces on integrated satellite net

WESTBORO, Mass. — Data General Corp. and Equatorial Communications Co. have announced a joint marketing agreement that will integrate Equatorial's satellite network products with DG hardware and software products.

The companies plan to develop joint proposals for point-to-multipoint data distribution and interactive satellite networks. With earth stations placed at user sites, the networks will enable DG users to bypass local and long-distance telephone company facilities, according to a spokesman.

Each station will be able to transmit and receive asynchronous or synchronous data at speeds up to 19.2K bit/sec. There are two types of stations available — an interactive station that has a 48-in. diameter and a point-to-multipoint station that has a 24-in. diameter.

Prices for a system will depend on a user's hardware configuration and options required.

DG is located at 4400 Computer Drive, Westboro, Mass. 01580. Equatorial Communications is headquartered at 300 Ferguson Drive., Mountain View, Calif. 94043.

United Technologies unveils PBX supporting 256 ports

ST. LOUIS.— United Technologies Communications Co. has announced UTX-1001VS, a digital voice/data private branch exchange (PBX) that supports 40 to 200 voice/data lines and a total of 256 ports.

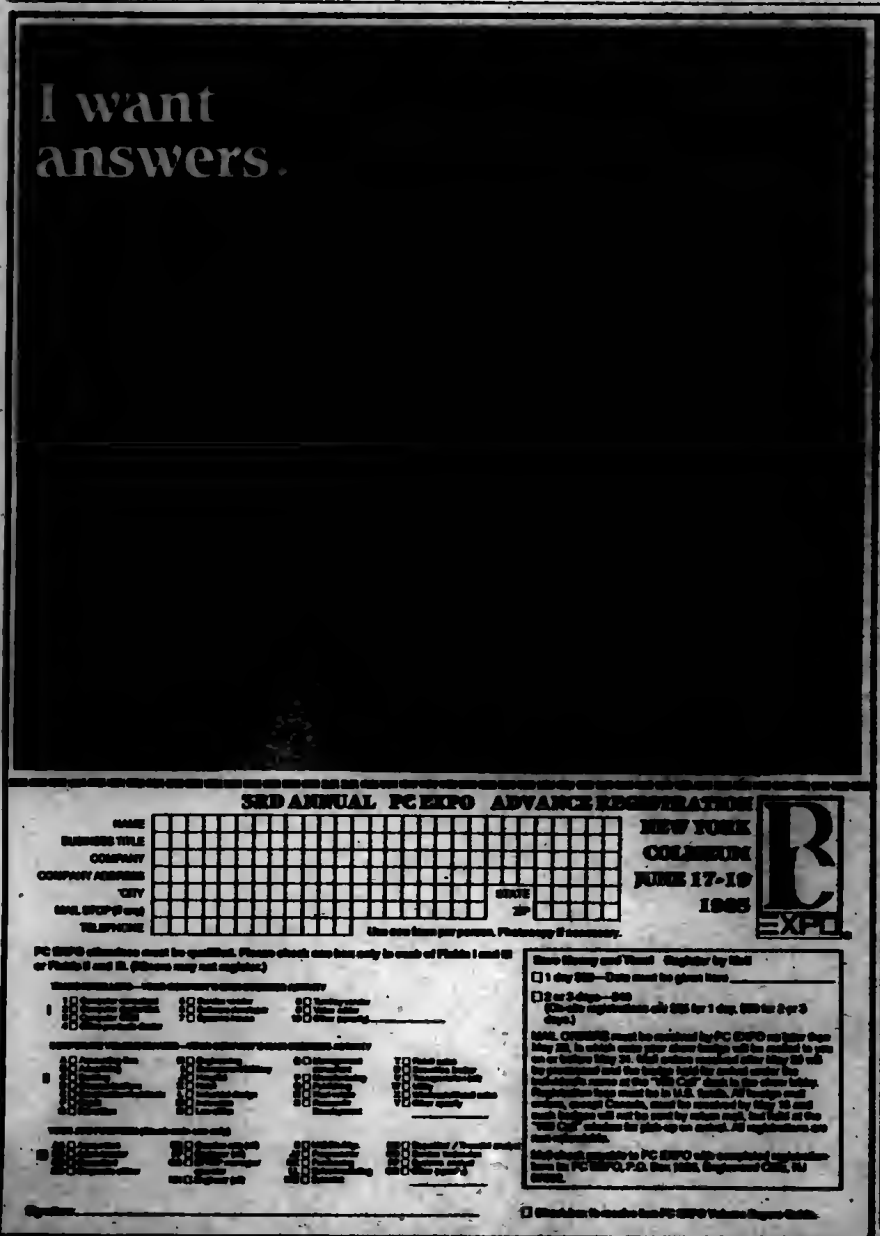
The product is said to have a digital, universal port structure. UTX-1001VS reportedly supports multiple-line and trunk configurations, and each port can be assigned to voice and/or data combinations. A spokesman said that in a simultaneous voice/data transmission, data can be supported at 4.8K bit/sec. When only data is transmitted, it can be sent at speeds up to 19.2K bit/sec.

Dual nonblocking switch matrices, one for voice and one for data, reportedly are standard for all ports. The PBX uses two-pair wiring and adaptive delta modulation.

The product's voice capabilities include integrated voice messaging, single-button access to station features and support for 2-, 8- and 15-line instruments, the vendor said.

UTX-1001VS prices range from $1,225 to $1,535 per line.

United Technologies Communications is located at 1224 Hern Ridge Pkwy., St. Louis, Mo. 63141.



IBM minis get option package

MANASSAS, Va. — Control Concepts has introduced ICP, a packaged communications option for IBM System/34, 36 and 38 minicomputers.

According to the vendor, the product contains the following four options: communications controller, modem rack, security module and synchronous modem. The communications controller emulates an IBM 5251 Model 12 or 3274 Model 51C controller. The controller emulation is said to enable remote terminals — Digital Equipment Corp.'s VT100s, personal computers or IBM 3270-type terminals — to access applications or data bases on the minicomputers.

A modem rack supports up to eight asynchronous modems that can transmit data at speeds of 1,200 and 2,400 bit/sec.

The synchronous, full-duplex modem provides 2,400 or 4.8K bit/sec. transmission.

ICP costs from $7,950 to $16,000.

Control Concepts can be reached through Box 2367, 12004 Balls Ford Road, Manassas, Va. 22110.

ETI release uses new AT&T rates

BOSTON — Economics and Technology, Inc. (ETI) has released ETI Private-Line Pricer Version 2.0, which includes recent changes to AT&T private-line tariffs.

A vendor spokesman said the product runs on an IBM Personal Computer under IBM's PC-DOS operating system, providing tariff information that enables users to determine communications costs using the new private-line tariffs.

The package supports complex rate restructuring, carrier special-access tariffs and carrier default or user-specified routing, the company reported.

The product is available in two configurations: one with AT&T default routing and the other with user-defined routing. The first costs $2,990, and the second costs $3,990.

ETI is located at 191 Tremont St., Boston, Mass. 02108.

Test Your Microcomputer IQ*

1. Name a totally integrated software package that was rated #1 by *Software Digest*. ____
2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it? ____
3. Who will educate IC personnel or end-users at their site or yours? ____
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation? ____
5. What provides a micro software facility that allows you to customize a system to your specific requirements? ____
6. Who are the premier micro consultants to the *Fortune* 1350 companies? ____
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals? ____
8. What is the easiest way for an IC manager to satisfy the many end-user needs in the organization? ____
9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come? ____
10. Name the companies that can provide all of the above? ____

*(Turn Page Upside Down for Answers)

1.DunsPlus Software 2.From DunsPlus 3.The DunsPlus Education Staff 4.DunsPlus's Communications Utilities 5.The DunsPlus Tool Kit 6.DunsPlus's Professional Consulting Staff 7.The DunsPlus Support Center 8.Call DunsPlus at 800-DNB-PLUS 9.Dun & Bradstreet, the parent company of DunsPlus 10.DunsPlus

If you answered all of the above correctly, you've already solved most of the problems facing you. If not, give us a call at 800-DNB-PLUS, or write us at 187 Danbury Road, Wilton, Connecticut 06897.

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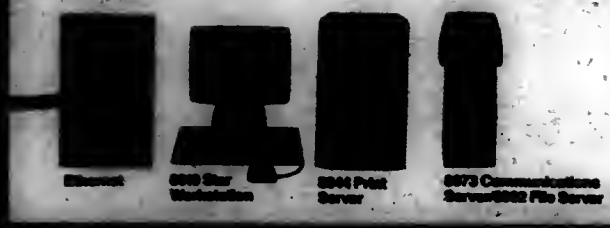

Matt's office has been winning a lot of new business lately. And it's really not much of a secret.

Because he and his co-workers have been able to make more efficient use of their resources. How? Well, Matt brought in Team Xerox.

Which includes Xerox 8010 Star

I heard you underbid us by half a million. What's your secret?"

Workstations, high speed laser printers, file servers for organizing and storing data and communications servers for accessing mainframe data bases, all linked together with a Xerox Communications Network. For complex analytical tasks, Xerox also included a Xerox Artificial Intelligence System.

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AT&T from page 93

the 6300 to their line since it was merely a fast IBM Personal Computer clone, and the clones lost their luster as IBM ramped up production.

AT&T has been using its private branch exchange sales representatives to sell its computer equipment. The sales representatives have learned a new technology and in many cases have developed a new set of leads.

In order to become a major league hardware player, AT&T has to establish a presence in larger corporations. Yet, AT&T has been slow to develop links to IBM mainframes. Almost a year after its introduction, the 3B line is still unable to communicate with IBM mainframes.

AT&T may be ready to solve this problem as analysts are predicting that the company will soon release a number of products that will tie its systems to IBM mainframes.

Betting on Unix acceptance

Rather than providing links with IBM, AT&T tried initially to bank on corporate acceptance of its Unix. Unix represents both AT&T's greatest strength and its primary weakness.

Unix has carved a niche in scientific and academic markets. But it has yet to gain a foothold in other markets and AT&T appears to be trying to force Unix acceptance into unwilling markets.

AT&T is hoping to bolster its presence in the personal computer market while simultaneously enhancing acceptance of Unix with the Unix PC.

The first piece of hardware that the telephone company developed for commercial use is an impressive machine with an icon-driven, user-friendly interface, a large screen and fast processor. Its version of Unix adds file and record locking, the lack of which were significant drawbacks to other variations of Unix.

AT&T expects that half of its Unix PC sales will come from direct sales to large corporations.

Two-pronged attack

This represents a two-pronged Unix attack. If the Unix PC is sold to large corporations, the corporations could develop an interest in large Unix systems. If the Unix PC becomes a big seller in large corporations, it will establish AT&T as a viable competitor with IBM and Apple Computer, Inc. in the microcomputer market.

However, there are few reasons for a large corporation to be interested in Unix PC. It, like the 3B line, lacks links to IBM mainframes.

Also, there are few popular microcomputer packages that run on the machine. Developers seem to be more interested in supplying products for such products as Apple's Macintosh.

And now that the barrier of 640K bytes of random-access memory on the IBM Personal Computer has been broken — with a bank-switching technique from Lotus Development Corp. and Intel Corp. — developers may be more interested in writing new applications for IBM than for AT&T machines. It will be interesting to watch what, if any, software is developed for the Unix PC in the next six months.

Handicapped by regulations

A fundamental problem for AT&T is that it is handicapped by regulations that prohibit the company from bundling its telephone and computer capabilities.

If the company could put together packages of computers and communications services at a special price its products may become more alluring to large corporations. Industry analysts expect that these regulations will be lifted in the long term.

For the short term, AT&T faces a number of challenges. None of these problems are insolvable, especially since AT&T has tremendous technical resources in Bell Laboratories — and deep pockets.

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SURVEY from page 93

declining order of times mentioned, included problem isolation (25%), inventory tracking (21%), vendor coordination (19%) and vendor response time (18%).

Network monitoring was cited 43% of the time by conference attendees as the most important network management feature. Trouble tracking (30%), performance reporting (23%), on-line trouble tickets (21%) and network inventory (17%) were also listed as important features.

The most important considerations cited by the managers in evaluating network management systems were, in order, service, field testing of a product, installation and support, reputation, financial stability and training.

Good service headed the list of the expectations that network managers have of vendors peddling network management systems.

NYNEX from page 93

work to provide capabilities similar to private lines. Features such as a local-exchange-wide Centrex and customer control networking will be part of this.

A second service being planned is Integrated Digital Services for answer supervision and incoming call identification.

Nynex said the aim of the Pathways family of services is to give all users a voice/data capability on a single circuit without regard to terminal interfaces, standards and bandwidth limitations.

The communications company said the offerings are part of its evolution to an integrated services digital network.

MINOLI from page 99

traffic occurs independent of itself. For example, an MIS manager might get a telephone call about a failed application and immediately turn around and place a call to a systems person. There is a correlation between the calls that network modeling methods generally do not recognize.

Although the exact effect of autocorrelation cannot be forecast, it can be taken into account by making presumptions, such as 10% of all traffic will have some kind of self-dependence.

■ Rarely does one have virgin traffic input because both voice and data are buffered at many stages within communications systems. This changes their original character in a way that could have a bearing on the number of facilities needed.

Take mode into account

For example, a voice message coming into a person's desk through a switching system represents a different type of traffic than when the same message, after going unanswered, is routed to a voice storage unit. Because network models do not factor in filtering, as it is called, network designers should take into account their particular needs and adjust the model recommendations accordingly.

The points presented here and in the previous column are not meant to argue that analytical models are useless but rather to convey some of their limitations. Models do play an important role in a sound network design, but comparison of the refinements of one model with another must be made with the specific assumptions of each model in mind.

When evaluating network models, it is important to maintain a focus on the improvement being sought. The percentage of improvement when using one model rather than another should always be explicitly determined. That determination will show if the adoption of the more accurate model will be worth the time and expense.

It would be wasteful, for example, to try to optimize a network using a more accurate model when an input traffic component may have an inherent error range of 20%.

Sophisticated model not always necessary

If your traffic input is within a 20% plus or minus error range — meaning, for instance, that you presume your network is going to handle 20,000 messages a day when it may actually handle 24,000 or 16,000 messages — it would not pay to try optimizing your network with a more sophisticated model. Some users have been known to try to fine-tune one part of their network design within 5% of accuracy while other parts are left at 20% accuracy.

The practitioner should always attempt to keep a proper perspective of network models so that the confidence and reliability of the various assumptions are in the same approximate range, without expending resources to refine a part of the equation only to find no valid marginal utility.

This approach toward network models will actually save design and implementation money for a typical Fortune 500 firm.

CANADA from page 99

ada said bypass may not be apparent. Should billing by the bit be implemented, Janisch said, it will represent one more step toward rate rebalancing, wherein telephone usage and service charges accurately reflect the costs to the telephone company of providing services. And, Janisch said, "The specter of bypass is the driving force behind rate rebalancing."

Current telephone rates in Canada are affected by cross-subsidization — the subsidization of local rates by long-distance revenue. Prior to divestiture, the same situation prevailed in the U.S. Some telephone company services in Canada continue to be charged at rates well above their actual cost. This sets up the incentive for bypass because the alternate services can come in at lower prices. By seeking rate rebalancing, the telephone companies can reduce the incentive for bypass and thus preserve their customer base.

A number of large Canadian companies are already looking toward developing their own private telecommunications networks to insulate themselves from the telephone companies as much as possible. Should bypass become legal, these firms would be the first to commit to it.

George Dej, president of the Canadian Business Telecommunications Alliance, concedes that, if bypass becomes a legal reality in Canada, there would probably be a lot of support for it among Canadian businesses.

Some organizations, Dej pointed out, would like the opportunity to deal directly with Telesat Canada, rather than having to go through the telephone company. And others, he said, depending on their ability to obtain rights of way, would probably lay their own fiber-optic cable networks or install microwave systems.

The Canadian Radio-Television Commission (CRTC) is expected to deliver a statement on the issue when it announces the results of last fall's interexchange hearings. While CNCP's proposal to offer competitive long-distance services dominated those hearings and will be foremost in people's minds when the CRTC's decisions are announced, statements of direction with regard to bypass and the sharing of telecommunications services are expected. The telephone companies have already told the CRTC that they believe bypass cannot be prevented if the economic incentives for it remain in place.

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SYSTEMS & PERIPHERALS

DEC slashes $300 off price of VT220 units

MAYNARD, Mass. — Digital Equipment Corp. lowered the price of its VT220 CRT terminal by $300, a move industry analysts said was a reaction to increased competition in the marketplace.

The company said the VT220 now costs $1,096, down from $1,396. The price cut is the second significant pricing action DEC has made on the VT220 since its introduction in November 1983. When announced, the VT220's list price was $1,295. Last summer, DEC increased the purchase price by $100.

DEC cited volume shipments of the VT220 as the reason it was able to shave $300 off the purchase price. Industry analysts, however, contended that DEC officials have been disappointed in VT220 sales in light of competition from vendors making VT220-compatible terminals, some of which are priced between $700 and $800.

Further information is available from DEC, which is located at 146 Main St., Maynard, Mass. 01754.

IBM updates printers

Boosts band printer, cuts prices, drops products

By Tom Hoshel
CW Staff

RYE BROOK, N.Y. — IBM has announced four models of its 4245 band printer and an automatic sheet feed feature for its 4214 printer. In addition, IBM cut the purchase prices on its 4245 and 4248 printers and said it was withdrawing six other products from its marketing lineup.

IBM's band printer works at speeds up to 1,200 line/min.

The band printers are the Models 12, D12, 20 and D20. Models 12 and D12 print at up to 1,200 line/min, and Models 20 and D20 can print at up to 2,000 line/min. Model 12 and Model 20 attach directly to the byte multiplexer, selector or block multiplexer channels of IBM 3090, 3080, 3030 and 4300 series mainframes as well as 370/148, 158 and 168 CPUs. Models D12 and D20 attach, via coaxial cable, to IBM's 3274 control unit and 4701 finance communications controller. The Models D12 and D20 can also attach to an IBM 4361 series mainframe through a workstation adapter, IBM said. The Model 12 is field upgradable to the Model 20, and the Model D12 is field upgradable to the Model D20. Standard features of all four printers include optical character recognition (OCR) printing support and a 20% floor space reduction over the older 4245 Model 1. The units support both OCR A and B fonts and the European Computer Manufacturing Association Subset ,11/ National Retail Merchants Association extended alphabets, IBM said. Other features include 132 print positions, the ability to print 10 char./in. and skip speeds of 24 and 55 char./sec.

The 4245 Model 12 and Model D12 cost $28,000 with a monthly maintenance charge of

See PRINTERS page 110

■ A parallel processor has reached a computational speed of more than 100 times that of its component processors/104

■ Datamedia unwrapped two processors for its AT&T Unix-based 932 supermicrocomputers/104

■ Eastman Kodak released four computer output microfilm products/106

■ Northern Illinois University replaced its Amdahl 470/V8 computer with an Amdahl 5850 machine in less than eight hours/110

■ Point 4 Data unwrapped its multiuser Mark 4 Tower, which is compatible with other Point 4 systems/110

Cluster controller out for IBM environments

ATLANTA — C. Itoh Electronics Co.'s CIE Systems Division has unwrapped an IBM 3274-type data processing cluster controller that supports IBM and compatible 3178, 3179, 3278 and 3180 terminals, printers and other peripherals in IBM mainframe environments.

The CIE 4000 cluster controller — said to be a replacement for the IBM 3274-61C remote controller — costs $4,700. It establishes a logical and physical connection between the host computer and peripheral units to perform housekeeping tasks such as regulating data transfers and minimizing processing interruptions due to peripheral activity.

Users can load software via diskettes, and the controller supports input devices such as light pens and multiple Ascii and IBM 3270-type printer devices, the vendor said. Translation between personal computers with Ascii code and IBM mainframes with the Ebcdic system are handled by the controller.

Remote support

The unit is said to support as many as 16 3270-type devices, located as far as one mile from the controller. The controller connects to the host system by telephone line or limited-distance circuits operating at data transmission speeds of up to 9.6K bit/sec.

It can connect to networks via IBM's Binary Synchronous Communications or Systems Network Architecture/Synchronous Data Link Control protocols, the vendor said.

More information can be obtained from CIE Systems, which can be reached through P.O. Box 16579, 2515 McCabe Way, Irvine, Calif. 92173.

IBM 3270s have peaked in popularity, study says

By Tom Hoshel
CW Staff

FRAMINGHAM, Mass. — IBM's 3270 and the many compatible versions of the popular CRT terminal have reached their popularity peak and will begin a decline over the next five years.

That is the conclusion of a recent study by International Data Corp. (IDC), a market research firm here, which contends that microcomputers with 3270 communications capabilities are quickly eroding the mighty 3270 terminal marketplace and by 1989 will outstrip sales of 3270-type terminals.

But while the demand for 3270-type terminals may be declining, IDC reports that the need for 3270 communications capabilities is steadily increasing. IDC said that between 1983 and 1984, for example, there was a 41% growth rate in shipments of devices supporting 3270 communications. Products included in this growth rate include not only the 3270-type terminal but also microcomputers and protocol converters.

By 1988, IDC projects that 3270-type terminal shipments will start to decline. By 1989, IDC sees the growth rate for the market dropping off by roughly 10% per year.

Increasingly competitive pricing on 3270-type products from IBM will cause continued heartaches for makers of 3270-compatible products, IDC predicted. In 1984, for example, IDC said the bulk of the 3270 business, 79.3%, went to three companies: IBM, ITT Courier and Telex Corp. "There is still much unsettled business in store for the 3270 plug-compatible manufacturers. In IDC's judgement, the 3270 display market is not going to disappear; however, it is not going to be a lucrative market for many players."

CW CHART BY MICHAEL J. MARR

By the end of the decade, IDC said, up to 40% of the 3270 terminal market will have been lost to microcomputers. Those most likely to use a micro instead of a 3270 terminal include managers, secretaries, programmers, scientists, engineers and other business professionals.

But in spite of predictions of eminent doom at the hands of microcomputer makers, IDC said at least some makers of 3270 terminals have been able to hold their own. In 1984, IDC said, the 3270 terminal market grew 19.2% with total shipments of 633,385 units.

See 3270 page 104

SYSTEMS & PERIPHERALS

Unit called 100 times faster than component chips

By Donna Balmond
CW Staff

CAMBRIDGE, Mass.— Bolt, Beranek and Newman Laboratories, Inc., has produced a version of its parallel processor computer that is said to be more than 100 times faster than any of the machine's component processors. This achievement of linearity with a 128-processor machine sets the stage for development of much larger models, Bolt, Beranek and Newman's John Goodhue said.

The largest version of the firm's parallel processor — the Butterfly — uses 128 Motorola, Inc. 68000 chips and has a processing speed of 60 million instructions per second, according to David Walden, president of the firm. It will be used for computation-intensive applications such as experimental simulations and design systems, he said.

The tightly coupled parallel processing machine uses special co-processors designed by Bolt, Beranek and Newman to aid the 68000s in parallel computations, Goodhue said. It runs under the firm's Chrysalis operating system.

The Butterfly system's architecture increases bandwidth, memory and I/O capacity in an additive fashion, the vendor said. Key elements of the system include a custom very large-scale integration switching chip, custom microcode to support the system's parallel architecture and a multiprocessor operating system.

C-language programs can be converted to take advantage of parallel processing, Goodhue said. "All applications software that we wrote were in standard C. It is no different than any other C application," he said.

Bolt, Beranek and Newman used a tight coupling or shared-memory architecture — a switching system that adds data capacity as processors are added, Walden said. All processor elements have full access to all memory locations in the system, he said. This approach is said to add memory and I/O capacity as processors are added to avoid potential bottlenecks as the overall system size increases. The number of additional switching points grows arithmetically rather than exponentially, he said.

The Butterfly research project began in 1978, a spokesman said, and more than a dozen experimental systems are in use, primarily as research tools at U.S. Department of Defense-sponsored research and development facilities that participate in the department's Defense Advanced Research Projects Agency's (Darpa) Strategic Computing Program, a spokesman said.

As part of a recent contract with Darpa, the company will build 10 16-processor Butterfly systems for Strategic Computing Program participants during 1985 and 1986, the vendor said. The processor is available commercially to "anyone who meets export control requirements and is willing to buy a computer engine with limited support," a spokesman said, but Bolt, Beranek and Newman has not officially made the processor a product yet.

More information is available from Bolt, Beranek and Newman, which is located at 10 Moulton St., Cambridge, Mass. 02238.

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XCP introduced by Datamedia

NASHUA, N.H. — Datamedia Corp. has introduced two processors for its AT&T Unix-based 932 supermicrocomputers.

The Unix Communications Processor (XCP) handles communications tasks for the system and off-loads communications responsibilities from the CPU. It is configured with Motorola, Inc.'s 68000 microprocessor and 512K bytes of shared system memory, the vendor said. Two RS-422 serial lines, each supported with local direct memory access (DMA), provide asynchronous or synchronous communications. The XCP processor can support communications with transfer rates of up to 256K bit/sec. XCP also supports four RS-232C asynchronous ports and one serial and parallel printer interface.

Each processor is priced at $3,250, according to the vendor.

For more information, Datamedia is located at 491 Amherst St., Nashua, N.H. 03063.

3270 from page 103

During this same time period, the installed base of 3270 terminals grew 17.9% totaling 2.9 million. Although these figures look impressive, IDC cautioned that they can be misleading if viewed only on a short-term basis.

Over the next five years, IDC estimates a 14.4% compound annual growth rate for 3270 shipments and a 15.8% compound annual growth rate for the installed base. IDC contends that the 3270 communications protocol has become a universal standard.

The report is titled "3270 Market" and costs $1,200.

IDC is located at 5 Speen St., Framingham, Mass. 01701.

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SYSTEMS & PERIPHERALS

Kodak rolls out computer output microfilm products

ROCHESTER, N.Y. — Eastman Kodak Co. has released a turnkey document image management computer system, an imaging system for computer output microfilm and two microfilm retrieval terminals that integrate plain-paper copying technology.

The turnkey KAR-8800 computer-assisted retrieval system is Kodak's top-of-the-line system for document image management, the company said. The basic configuration includes a Prime Computer, Inc. 2550 supermidicomputer running under Prime's Primos operating system and equipped with Prime's Information data base management system. The system's storage capacity begins at 300M bytes and can be expanded to 1,200M bytes, the vendor said.

The KAR-8800 is a multiuser system that can support from 16 to 32 CRT terminals and microimage terminals. It can be used as a stand-alone computer or can be connected to any mainframe that can use IBM formatted tapes for information sharing and exchange. A tape drive opens this upload/download gateway to data bases maintained on mainframe computers, the vendor said.

The KAR-8800 with 2M bytes of main memory, a 300M-byte disk, a streaming tape drive, 16 ports, the Prime Information software and the Primos operating system costs approximately $165,000.

The Komstar imaging system is said to create, duplicate and collate microfiche and output data on 16mm microfilm with image marks to permit automated retrieval. The system provides in-line, integrated control of all computer output microfilm (COM) operations, the vendor said. The 16mm output is retrieved at the front end of the process for off-line duplication.

Kodak said it expects that the majority of installations will encompass on-line COM processing and in-line finishing, but the modular Komstar system can operate off-line and may be configured without a finisher.

The system is said to be compatible with all current IBM mainframes and operating systems, and it will support most other computers through the use of 1,600 or 6.25K bit/in. magnetic tape. Komstar costs $141,000, the vendor said. With a finisher and duplicator portion on-line, the cost increases by $62,000. With a finisher and duplicator portion off-line, the price increases by $53,000.

Inexpensive microimage copies

The IMT-350 microimage terminal and the Starvue II reader/printer both provide the ability to copy microimages onto plain paper at a cost of less than 2 cents each, the vendor said.

The IMT-350 microimage terminal — compatible with the Kodak KAR-8800, KAR-4400 and KAR-2200 information systems — is an automated micrographics workstation with integrated copier functions. It can monitor its own operations, accept search, print and text instructions (up to 100 commands) directly from an interfaced computer and communicate with operators in English-language phrases, the vendor said. The self-threading Starvue II reader/printer is for organizations with fewer time-critical or small-volume applications. The units both have 250-sheet supply cassettes which are used to load paper into the terminals. Each will accept 8½- by 11-in. bond or European DIN standard A4-size or B5-size uncoated stock. The paper cassettes can be loaded horizontally to make prints of microimages that are wider than they are long, such as computer printouts.

The IMT-350 costs $16,995, and the Starvue II costs $10,699.

More information is available from Eastman Kodak at 343 State St., Rochester, N.Y. 14650.

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School graduates to larger mainframe

Illinois university replaces Amdahl V/8 with firm's 5850

By Dianne Rainwaldt
CW Staff

DE KALB, Ill. — Pleased with the performance and service it received from its Amdahl Corp. 470 V/8 series mainframe, Northern Illinois University (NIU) here decided to call upon Amdahl once again, this time for a larger 5850 mainframe, which the school's DP manager said was installed in less than eight hours.

"We had adequate floor space to position, install and run tests before we brought down the old system and uncabled the peripherals," said John Tuecke, executive director of computing facilities at NIU. The university bought an Amdahl 5850 to replace a five-year-old Amdahl 470 V/8, he said.

The V/8 system had become inadequate for growing administrative applications, Tuecke said. "Our [on-line] transaction load for update and inquiry transactions increased from 12,000 a day to 30,000 a day," he said, after the installation of a student financial aid system and a bursar accounting system. The 5850, which is about the same physical size as the V/8, cut the university's response time from 1.7 sec. in production to about 1 sec. or below, Tuecke said. But the real benefit was in the bursar accounting system applications software that was being tested at that point under IBM's CICS test environment, he said. "The response time in test was so poor it was measured in minutes rather than fractions of seconds," he said. "If we stole from production, production would suffer, but by going to a new system we were able to get subsecond response time as we wanted," he added.

Tuecke considered proposals from IBM for a 3081 Model D and from National Advanced Systems, Inc. for an AS/9060. Although he had an Amdahl in house already, it was not a foregone conclusion that the new machine would be from the same vendor, he said. The price of the Amdahl 5850 (the university will pay $2.28 million over a five-year period in purchase price and interest) was "very competitive, particularly against IBM," Tuecke said. Amdahl was willing to give the university a more than current market value trade-in price on the V/8, he added.

The 5850 gives the university twice as much main memory — 24M bytes as opposed to 12M bytes on the V/8 — and increases the number of channels from 12 to 16, he said. The 5850 is said to perform at 11.5 Mips, based on published results of other people's benchmark tests, Tuecke said. That compares with a 6.5 Mips rating for the V/8, he said.

Another reason for going with the 5850 was that Tuecke was already happy with the service he obtained from Amdahl, he said. "NIU has a very difficult problem in attracting skilled systems programmers," he said, partly because of the university's low pay scale and its proximity to Chicago, which has plenty of such jobs in industry. Tuecke must look to the vendor for high levels of support, particularly for software, he said. "We looked very carefully at the service philosophy of other companies and felt that Amdahl was the best bet," he said.

The 5850 uses the same peripherals and software as the V/8, Tuecke said, and for the most part, the users (administrators, students, researchers) did not even realize their machine had been replaced. The 5850 has capabilities that will not be realized until the university can afford to implement them, such as faster channel rates, he said.

Tuecke's plan called for a test of the new system two weeks before Thanksgiving weekend in 1984. He was going to test it in a four-hour period after unhooking the V/8, note any changes that had to be made, reconnect the V/8 while changes were made, and complete the installation during Thanksgiving weekend, he said. But the tests went so well, he completed the installations during the initial test phase, he said.

Point 4 Data supermicro unwrapped

IRVINE, Calif.— Point 4 Data Corp. has released its Mark 4 Tower multiuser supermicrocomputer that is compatible with other Point 4 systems and runs with Point 4's Iris operating system.

The Mark 4 Tower — available to value-added resellers — features a 280-nsec, 16-bit CPU that is said to be capable of executing over 3 million instructions per second. The supermicrocomputer has 512K bytes of mapped memory, a peripheral interface board with built-in Winchester disk, diskette and cartridge tape streamer controllers as well as an eight-port asynchronous direct memory access multiplexer, expandable to 16 ports. The modular system can support up to three Winchester disk drives for an expanded capacity range of 86M bytes to 258M bytes.

The unit reportedly occupies less than two sq ft and with 512K-byte mapped memory, 86M-byte Winchester drive, 45M-byte ¼-in. cartridge tape streamer, power supply, Tower cabinet and the Iris operating system with Business Basic, costs $21,995.

More information can be obtained from Point 4 Data, 2569 McCabe Way, Irvine, Calif. 92714.

PRINTERS from page 103

$300. Models 20 and D20 cost $35,000 with a monthly maintenance fee of $400. IBM also cut the price of its 4245 Model 1 printer from $54,500 to $35,000.. In addition, IBM cut the purchase price of its 4248 impact line printer from $90,000 to $75,000. Also announced was the 4214 automatic sheet feed feature for the company's 4214 printer. The unit costs $1,650 with a $24 monthly maintenance charge.

IBM added it was withdrawing six products from its current lineup as of Aug. 1: the 1403 Model N1 printer; the 2821 control units Models 1, 2, 3, 5 and 6; the 3211 Model 1 printer; the 3811 Model 1 printer control unit; the 4245 Model 1 printer; and the 5152 graphics printer.

More information is available from IBM, Rye Brook, N.Y.

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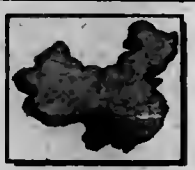

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COMPUTER INDUSTRY

Fasb software accounting plan given sparse support

By Charles Babcock
CW New York Bureau

NEW YORK — A proposed method of accounting for the costs of software to be marketed won little support during public hearings here recently.

Two groups that addressed the Financial Accounting Standards Board (Fasb) took opposite stands on the issue. The Association of Data Processing Service Organizations, Inc. (Adapso) urged the board to adopt a method of capitalizing software costs, while the American Electronics Association (AEA) advocated straight-expense reporting as the costs are incurred.

Robert Wayman, spokesman for the AEA, said he was also speaking as chief financial officer for Hewlett-Packard Co., which expenses software development costs. HP's approach contrasts with IBM's practice of capitalizing much of its software costs, according to IBM spokesman Earl F. Wheeler.

Few of the speakers embraced the proposed accounting method, which combines expensing some of the software costs as they are incurred while capitalizing others. When software is in the design and feasibility stage, costs would be expensed. Once it goes to coding, testing and making master copies, those costs would be capitalized, according to the proposed standard.

The Fasb is attempting to establish a common standard for the mixed practices that now prevail. The Securities and Exchange Commission (SEC) issued a memoran-

See FASB page 131

Foreign telecom market tough

By Clinton Wilder
CW Staff

NEW YORK — U.S. telecommunications firms seeking to crack international markets face governmental, financial, technological and cultural barriers, according to a forum of telecommunications executives held here recently.

Most participants in the third EIC/Intelligence, Inc. telecommunications forum also agreed that finding ways around those barriers is critical for corporate success in the data and voice communications industry. "The [U.S.] balance of payments in electronics is far worse than in automobiles," said Walter F. Light, recently retired chairman of Canada-based Northern Telecom, Ltd. "Time is of the essence."

Overseas marketing is a major hurdle, particularly for smaller companies, according to Peter Erb, former chairman of Millicom, Inc., an international communications marketing firm. "In Europe, you can't sell a product that is not supported well locally," Erb said. "Japan and several European countries have large, integrated trading companies that take small [native] firms under their wing and help them market. For the small American companies, marketing muscle is what's missing. The reason IBM has been successful is that it is primarily a marketing company, not an engineering company."

Several executives suggested that the true international growth area for tele-

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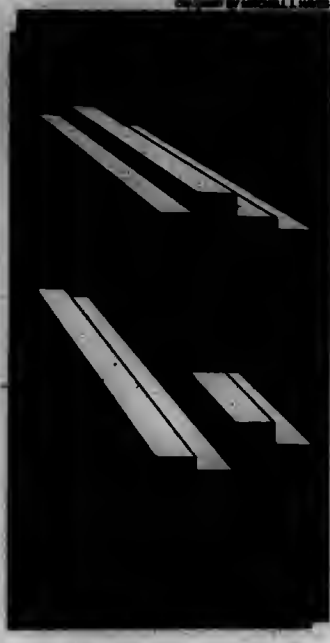
■ Xerox will lay off 500 workers and relocate 600 others in a reorganization around its new computer products/116

■ New IBM boss John Akers can look forward to a decade of one-man rule/122

■ The current industry slump has been caused by the transition to an emphasis on smaller systems, an IDC analyst said/128



Commerce stats: mixed signals?

WASHINGTON, D.C. — New orders for office and computing machinery dropped 35% from $7.9 billion in February to $5.16 billion in March, according to figures released by the U.S. Department of Commerce last week. At the same time, however, mixed signals in the computer industry were evident in an increase of 16.7% in the value of shipments from January through March as well as a steady increase of 19.2% in the value of unfilled or backlogs of orders for equipment for the three-month period.

Cynthia Latta, senior economist for Lexington, Mass.-based Data Resources, Inc., a unit of McGraw-Hill, Inc., said it is dangerous to make generalizations on the basis of one month's statistics, pointing to the 160% increase in office and computing machine orders placed between January and February, according to Commerce Department figures.

Latta said she is inclined to believe there is softness in the economy as far as the computer industry is concerned. "If their orders are off and their profits are down, you can't argue with that," she said. The economist pointed out that the increase in backlog shown in the Commerce Department figures indicates that the computer industry is aggressively keeping its inventories under control.

INDUSTRY INSIGHT
Clinton Wilder
CW Staff Writer

High tech on its own

Imagine a scenario with computer companies and industry analysts in one room, and those who follow the overall U.S. economy in another. Now the folks in Room No. 1 are a little depressed at the moment, since just about everyone from IBM on down has said things are slow and won't get much better until, depending on who you ask, the second half, the fourth quarter or early next year. But most observers are confident that the current industry downturn will become an upturn at some point in the near future.

In Room No. 2, the mood is currently upbeat, but with the underlying apprehension of F. Scott Fitzgerald's Jazz Age revelers just before the Great Crash. The boom economy of 1984 has begun to stumble, and most indications are that it's going to get worse. Two large deficits — trade and the federal budget — are not getting any smaller, and that doesn't bode well for recession fears.

So why are those high-tech folks in the first room so optimistic for the end of 1985? Is the projected upswing line on the computer industry growth chart going to pass

See INSIGHT page 131

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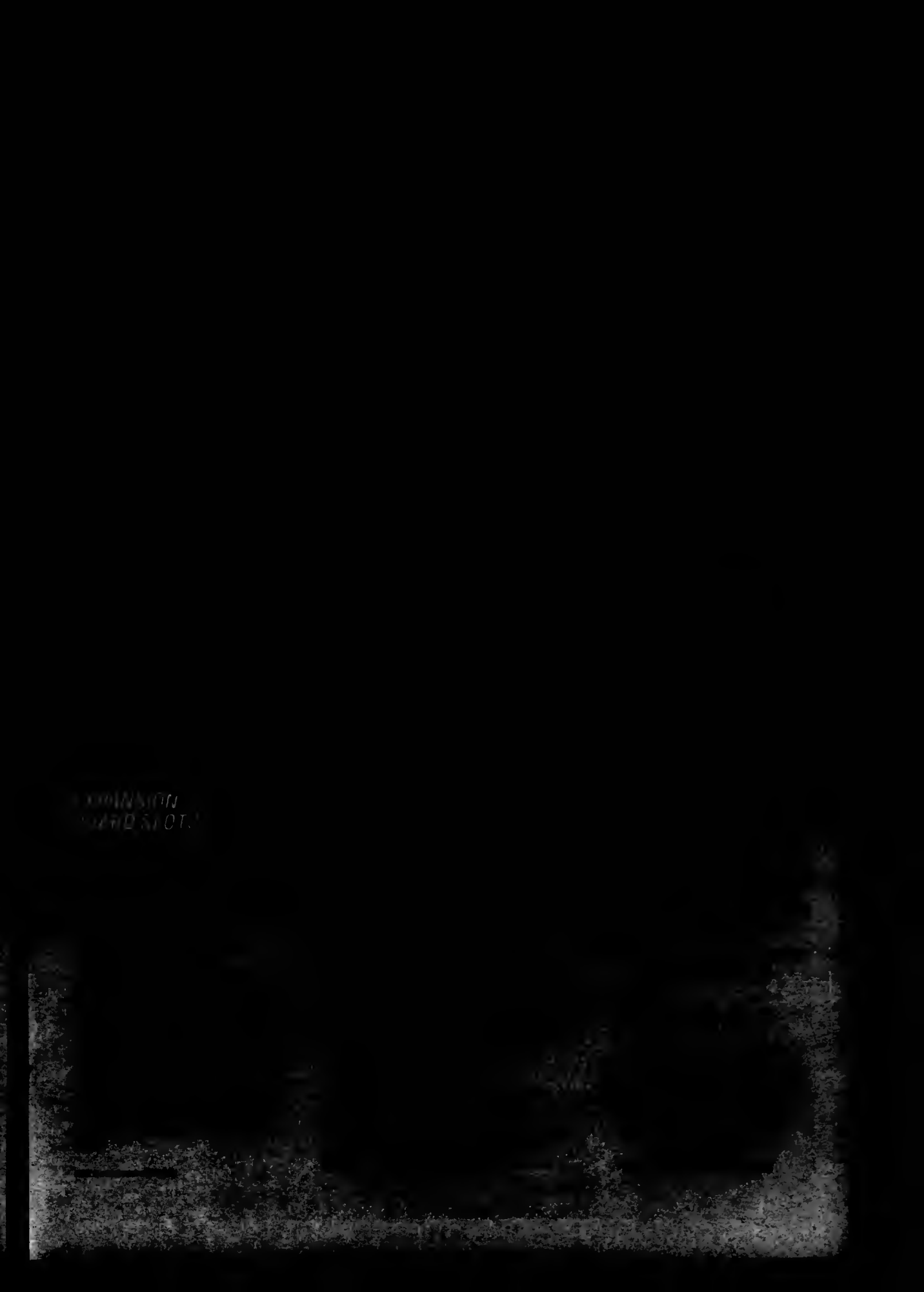

Harris to merge Lanier, Information Systems sectors

NEW YORK — Harris Corp. recently announced it will combine its Lanier Business Products, Inc. and Information Systems groups into one entity, encompassing 12 business units, effective July 1.

The reorganized group will retain the name of Information Systems and, according to Harris, will represent an $800 million entity dedicated to serving the converging data processing, office automation and communications markets worldwide.

Joseph A. Boyd, chairman and chief executive of Harris, said, "This new structure achieves the synergism envisioned at the time of the Harris-Lanier merger 18 months ago."

The Information Systems group will be headed by Jack C. Davis, senior vice-president and sector executive, who will report to John T. Hartley, Harris president and chief operating officer.

A component of the new organization will be the Business Information Systems sector, headed by Wesley E. Cantrell, who will be named senior vice-president of Harris and president of Lanier. It will consist of the National Accounts Division, serving large customer organizations, and the Lanier Business Systems Division for small and medium accounts and large accounts not served by the National Accounts Division.

Boyd said the reorganization "will make available Harris' extensive line of information management products from a single source, together with the technology required to interconnect these products."

Also, Harris recently released its third-quarter financial report showing a 13% decline in profits compared with those of a year earlier.

The company posted profits of $17.2 million, or 42 cents per share, compared with $19.8 million, or 50 cents per share, for the year-earlier period. Revenue was $574.1 million, compared with $502 million a year earlier.

Boyd said earnings for the former Information Systems segment were down sharply, reflecting weak demand and competitive pressures. Semiconductor sales produced a loss for the quarter, according to the company.

Sperry posts 32% profit hike in '84

NEW YORK — Sperry Corp. recently reported a 32% increase in profits for fiscal year 1984, with a 43% increase in profits from continuing operations.

Those figures included a charge of $24.1 million from the write-down of the company's investment in Trilogy Ltd., a charge of $12.7 million for an arbitration proceeding and credits of $64 million from the reversal of deferred income taxes.

For the year, the company posted profits of $286.7 million, or $5.15 per share, on revenue of $5.68 billion. In 1983, the company posted profits of $216.2 million, or $3.86 per share, on revenue of $4.19 billion.

Fourth-quarter results

In the fourth quarter, the company posted profits of $105.9 million, or $1.89 per share, on revenue of $1.79 billion. A year earlier, the company posted profits of $86.8 million, or $1.53 per share, on revenue of $1.48 billion.

Gerald G. Probst, chairman and chief executive officer, said the company's commercial computer business experienced a very strong fourth quarter, with revenue up 35% over the year-earlier period and operating profits up 76%.

For the year, commercial computer revenue was up 22%, and operating profits were up 43%.

Photo: Ron Kimball

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Xerox announces reorganization; work force affected

NEW YORK — Following the introduction of its personal computers and laser printers [CW, May 6], Xerox Corp. announced a reorganization around its workstation group that will result in the elimination of 500 jobs and relocation of some 600 additional positions.

The company has also realigned its three-member corporate office, effective May 16. Former Chairman C. Peter McColough relinquished that position and was named chairman of the executive committee of the board of directors. David T. Kearns, who was president and chief executive officer, retained the title of CEO and was named chairman; the position of president was not filled. William F. Glavin, formerly executive vice-president, was named vice-chairman.

Xerox restructured its Systems Group to form a new Information Systems division and named as president of the division Elliott D. James, formerly vice-president and group executive with Harris Corp. The division combines the planning, development and manufacture of office systems, microcomputers and word processors, electronic publishing equipment, applications software and artificial intelligence systems, according to Xerox.

The restructured Information Products division will continue under the direction of its current president, Renn Zaphiropoulos, and will consist of the electronic typewriter and printer division, including the Diablo printer business, Xerox said.

Goal is interconnection

Xerox, developer of the Ethernet network, said its goal with the products is to offer interconnection of its products and networks with those of other vendors within a public and private network range.

Xerox Systems Group President Robert V. Adams said a variety of Xerox networks based on technologies such as fiber optics and twisted-pair wiring will also be introduced.

To illustrate its commitment to interconnection, Xerox cited the software and hardware options that already connect Xerox 6000 series workstations to the Xerox network.

In addition, the firm said it will offer a network product for the Xerox 6060 series workstations that will support third-party software applications being developed for the IBM PC Network.

Xerox said it will target its computers and laser printers at the office work group. The computers will be offered with existing Xerox products in configurations for in-house publishing, document preparation and engineering design. Xerox also announced that it will establish the Xerox Software Center at its Rochester, N.Y., headquarters to sell and support personal computer software.

Chip makers set staff cuts

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — In a move that reflects continued hard times in the semiconductor field, two Silicon Valley chip makers recently announced work force reductions.

The layoffs will affect 650 workers at Signetics Corp. and 600 at Fairchild Camera & Instrument Corp.

Both firms blamed the personnel cuts on severe pricing competition and a decline in linear and digital logic semiconductor orders, which resulted in lowered revenues.

The Semiconductor Industry Association (SIA) said earlier this month that U.S. semiconductor shipments were $2.4 billion during the first three months of 1985, representing a drop of 15% from the last three months of 1984. The SIA said it expects chip sales in the U.S. to drop 10% this year.

The Signetics layoffs will affect 400 workers at the company's wafer fabrication plant in Sunnyvale, Calif., 150 employees at its bipolar chip fabrication plant in Orem, Utah, and 100 workers at its Albuquerque, N.M., operation. The layoffs will begin now and continue through the end of June, a company representative said.

Signetics, a subsidiary of the U.S. Philips Corp., made similar employment reductions in February, cutting 400 positions from its Sunnyvale operations and laying off 100 employees in its Albuquerque plant.

At Fairchild, 200 employees will be laid off when the company closes a silicon wafer manufacturing plant in Healdsburg, Calif., later this month. The Healdsburg plant is being closed because it is cheaper to purchase silicon wafers from outside suppliers, a Fairchild representative said.

Fairchild will also close a production plant in Wappingers Falls, N.Y., laying off 280 employees there, and will terminate 170 employees at its linear division in Mountain View, Calif. Approximately 50 workers from the Wappingers Falls facility will be transferred within the company when manufacturing operations move to a plant in South Portland, Maine, the representative said.

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Peachtree sale severs MSA ties to micro software market

ATLANTA — Management Science America, Inc. (MSA) announced last week the sale of Peachtree Software, Inc. to Intelligent Systems Corp. for an undisclosed amount of cash and notes.

The Peachtree operation was the remaining vestige of MSA's costly venture into the development and sale of microcomputer software products aimed at the retail and OEM market.

Intelligent Systems, based in Norcross, Ga., manufactures and markets enhancement products for microcomputers and color graphics display terminals through three operating divisions: Quadram Corp., Princeton Graphics Systems, Inc. and Intecolor Corp.

Although declining to reveal the sale price, MSA did say that reserves established during its fourth quarter were adequate to account for the disposition of its various micro software operations. The company had set aside almost $6 million in anticipation of the cost of bailing out of the micro software market; additionally, losses from those operations were set at almost $7 million for the year.

Products announced

At the Comdex/Spring '85 trade show held here last week, Peachtree announced two modules, Accounts Payable and Accounts Receivable, for its Back to Basics software series for use on Apple Computer, Inc.'s Macintosh.

Leland J. Strange, president and chief executive officer of Intelligent Systems, said Peachtree was "a good fit" in his company's growth plan. "Essentially, our strategic thrust has been, and is, toward the achievement of strong positions in several computer-related markets with good growth potential," he noted.

'Strong brand awareness'

"Peachtree Software is a highly familiar presence in multiple distribution channels, and its strong brand awareness as a major microcomputer accounting software firm strengthens our position in the enhancement market," Strange said.

MSA said that under terms of the agreement, it retained certain equipment as well as rights to distribute certain software as part of its micro-mainframe package, Expert Link.

Last October, MSA shocked the industry with its announcement that it would divest itself of all microcomputer software subsidiaries and focus on its traditional direct sales mainframe software market.

In January, MSA sold its Micro Distribution Division to Corporate Software, Inc.; in February, Edusware and Designware were sold to Encyclopedia Brittanica, Ltd. and Peachtree Software International was sold to foreign distributors.

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Datapoint, MDS set pact

SAN ANTONIO — Datapoint Corp. recently announced its board of directors have approved a previously announced nonbinding letter of intent to spin off the company's service organization and combine it with the service organization of Mohawk Data Systems Corp. (MDS).

Datapoint intends to spin off the service organization to Datapoint shareholders on a tax-free basis. The terms of the transaction call for the publicly traded service company to purchase the assets of MDS' service division for $86 million and to loan MDS an additional $20 million for working capital.

Although Datapoint has said previously that the resulting third-party service organization would be the largest such entity in the U.S., others in the third-party service industry have claimed that the new organization will be dealing primarily with servicing Datapoint and MDS equipment.

Both Datapoint and MDS are essentially controlled by investor Asher B. Edelman, who acquired substantial shares in both companies and forced them to adopt the liquidation strategy he successfully applied to Management Assistance, Inc., which has been split up and sold off. The linking of Datapoint and MDS has spurred criticism of Edelman, with some charging that he is using Datapoint to bail out MDS after failing to find a buyer for the MDS service organization. Recently, Edelman altered his strategy and declared an intent to retain Datapoint's systems operations.

In related developments, Datapoint said it has achieved substantial expense reductions and expects total annual cost savings to amount to $57 million. The reductions included the elimination of 310 jobs.

Datapoint also recently announced a cooperative marketing agreement with Fujitsu Business Communications, formerly American Telecom, Inc. The two companies announced completion of evaluation and connectivity testing of Fujitsu's Focus private branch exchange products and telecommunications applications with Datapoint's networking and office automation products.

FCC declines to outlaw AT&T's lease termination fees

WASHINGTON, D.C. — The Federal Communications Commission declined to outlaw termination charges that could be faced by customers of AT&T Information Systems who want to break leasing contracts for equipment. The FCC said that the termination penalties were a "commonly accepted business practice."

The Independent Data Communications Manufacturers Association (IDCMA) asked the FCC to declare the termination charges illegal, citing the alleged anticompetitive effect they have on the competitive equipment markets.

Other equipment manufacturers groups, such as North American Telecommunications Association (Nata), and users groups such as the International Communications Association and the Ad Hoc Telecommunications Users Association also requested that the provision be declared illegal.

These groups alleged that AT&T Information Systems was able to recover more than 100% of the equipment's initial costs as carried on the books.

The FCC said it found that the contracts were agreements entered into under state law and therefore parties would have to resolve differences at that level.

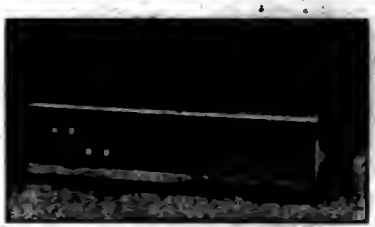
Nata counsel Albert Kramer said after the FCC decision, "While Nata is gratified that the FCC did nothing today that will prevent state courts from declaring AT&T's termination charges invalid, as we're sure they will do, at the same time we're extremely disappointed that the FCC did not find that the fees also violated federal law.

"The FCC ignored the discriminatory effects of the charges on the hundreds of independent CPE [customer premises equipment] suppliers and thousands of CPE users. Instead, it embraced the special-interest pleadings of the single dominant supplier: AT&T [Information Systems]," the Nata counsel said.

FCC Commissioner Mimi Weyforth Dawson noted at the meeting where the FCC unanimously declined to act that the termination fees currently affect approximately 61% of leased equipment contracts and are scheduled to expire in January 1988. Other FCC staff officials also made the point that AT&T has steadily lost market share for telephone equipment since the divestiture and deregulation of telephone equipment.

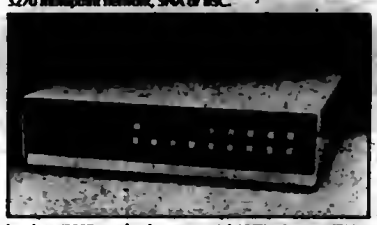
The FCC also noted in a release that state public utility commissions have consistently upheld termination liabilities as part of contracts and added that the waiving of the charges when the customer buys in-place equipment "is reasonable and consistent with prior FCC action." The FCC added that charges of over-recovery of equipment costs were "unsubstantiated."

Local Data Protocol Converters



DataLynx/3274 connects 1 to 9 async CRTs and printers to a 3270 multipoint network, SNA or BSC.

VersaLynx/3278 allows an IBM 3178/3278 terminal to access ASCII systems using asynchronous protocols.



InterLynx/3287 attaches low cost serial ASCII printers to IBM Type "A" coax ports on 3274/3276 controllers and 4331 CPUs.

DataLynx/S2ST connects 1 to 9 async CRTs and printers to a system/3X host.

InterLynx/3278 attaches low cost ASCII CRT terminals or PCs to Type "A" ports.

DataLynx/3780 connects asynchronous devices or minicomputers to 2780/3780 BSC networks, and has CRT and printer port and file transfer utility.

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LOCAL DATA

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Convergent sees profit downturn in first quarter

SAN JOSE, Calif. — Convergent Technologies, Inc. recently reported that first-quarter profits declined to $200,000, or 1 cent per share, compared with the first quarter of 1984 when profits were $1.8 million, or 6 cents per share.

Revenue for the quarter was $92.6 million, up from $65.6 million a year earlier but down 19.8% from record revenue in the fourth quarter of 1984.

Paul C. Ely Jr., president and chief operating officer of Convergent, said the results showed the company was making progress despite the small profit.

The company said it repaid all debt under its unsecured $100 million credit facility and does not anticipate any near-term borrowing.

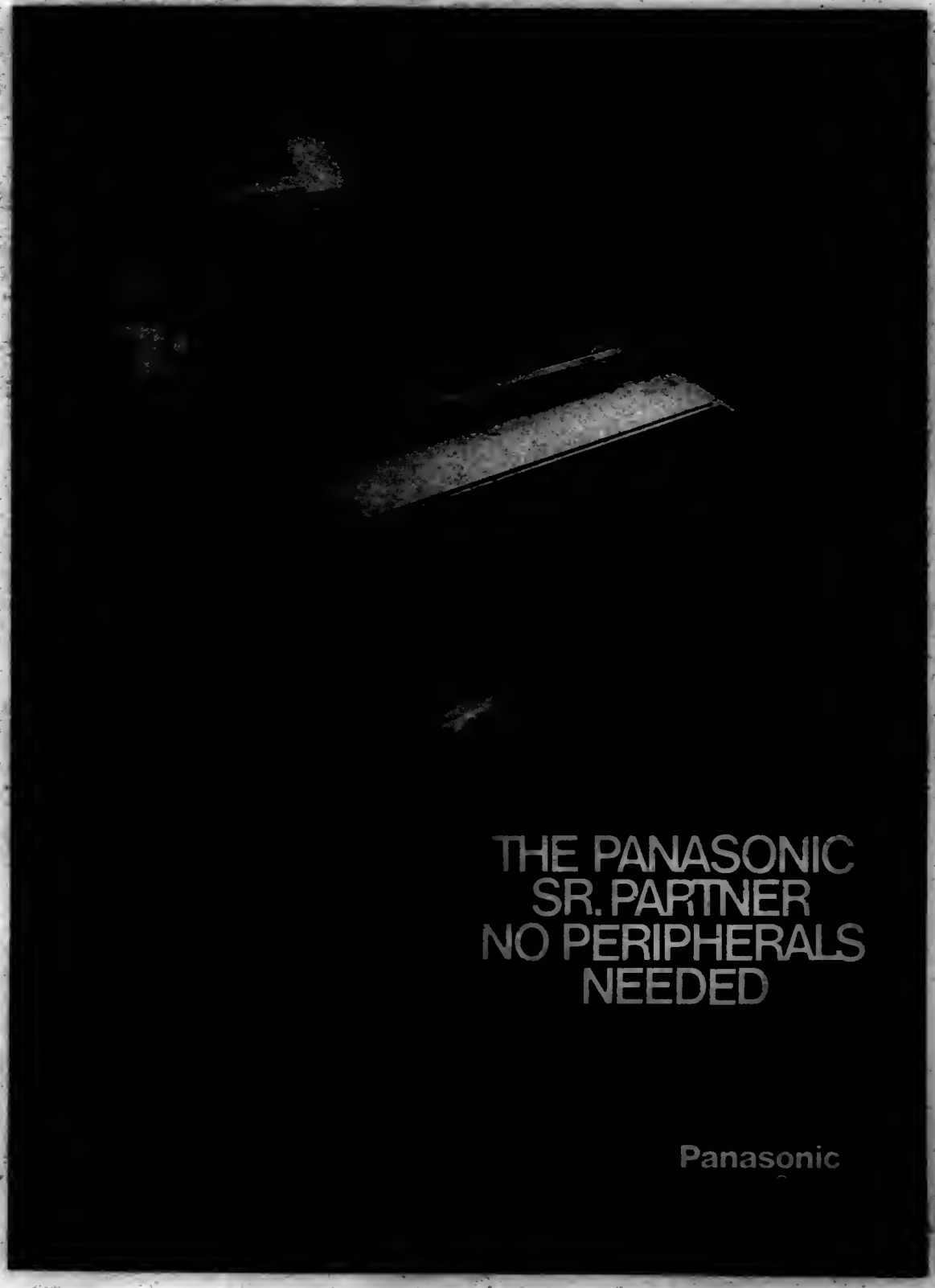
The company said revenue from the Convergent-built Unix PC being marketed by AT&T Information Systems offset revenue declines in other product lines. It attributed the revenue decline to the general weakness in the electronics industry.

Quarter profits shoot up at MCI

WASHINGTON, D.C. — MCI Communications Corp.'s first-quarter profits soared to $40.4 million, up from $5.9 million in the first quarter of 1984. Per-share earnings jumped to 17 cents from 2 cents, and revenue rose from $474.7 million to $570.6 million.

The results for the three months ended March 31 included $63 million in nonoperating income from a partial settlement with U.S. West, Inc. [CW, April 15].

Also included was a nonoperating expense of $50.5 million to reflect the decline in value of customer premises units that perform preprogrammed dialing for some MCI customers. The units will become obsolete as customers convert to MCI Dial-1 service. The same expense item in the year-earlier quarter was $40.9 million.


THE PANASONIC
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Akers regime to swap collegiate style for one-man rule

ENTERING LORES
Brian Jeffery

Second of a two-part series.

IBM has a new boss: John Akers. Akers took over as IBM's chief executive officer Feb. 1, and now holds the position concurrently with that of president. In addition, Akers, at 50, is young. He can look forward to perhaps a decade at the helm of IBM. IBM is clearly moving away from the "collegiate" style of leadership that has characterized it since 1981 to something closer to a one-man rule.

Akers has already begun to make his presence felt in the reorganization of IBM's Entry Systems Division, which has been cut back from a largely autonomous, $6 billion marketing and manufacturing operation to a more limited systems development and manufacturing unit.

Akers also appears to be associated with the renewed IBM emphasis on Systems Network Architecture (SNA), reflected in the higher priority now being accorded the company's SNA-based token-ring local-area network and the advanced SNA office automation capabilities under development since the '70s, with which IBM has done little to date.

Recent IBM moves to clean up many of its marketing and telecommunications operations also seem to be attributable, if not to Akers himself, at least to the tone that he is setting in the organization.

Rebound from decentralization

IBM appears to be rebounding from the decentralization binge begun in 1981 under then-President and now-Chairman John Opel. As discussed last week, IBM's policies from 1981 to 1984 resulted in much growth but too little coordination and a tendency for IBM units to pursue short-term goals that advanced their own interests rather than those of the company as a whole.

> *The emphasis of the Akers regime seems to be that IBM should act more as a unified company and less as a conglomerate.*

The following are among the areas now receiving attention:

■ The corporate information systems market. Although individual product lines such as host systems and Personal Computers have done well here, IBM is still a long way from pulling them together under a single, coherent scenario. The company's concern appears to be to establish a more in-depth penetration of this sector that will ensure that the growth of information processing usage here will be reflected in IBM's bottom line. In 1984, IBM's 2,000 largest U.S. accounts and their overseas counterparts still accounted for more than three-fourths of IBM revenue, and the general slow growth in the mid-range systems bracket and a slowdown in the personal computer market have led to a renewed focus on this area.

Like everyone else, IBM has done its homework about the growth of information processing among large organizations, and the company's game plan is to provide a wide range of products, systems and services integrated under SNA that will result in a more in-depth penetration than selling individual products for individual applications. Thus, last October IBM finally announced a scenario that provides realistic links between its Personal Computers and its host-based office systems. By the end of 1985, IBM is also likely to have its token-ring local-area network out and to have made its first introductions for handling voice and advanced image processing under SNA. If IBM can succeed in establishing SNA as the main environment for large systems users to implement OA, it will be assuring itself a stable and lucrative revenue stream well into the next century.

■ Telecommunications. For several years, IBM has been accumulating relatively small and not very viable telecommunications operations, such as its Information Network service bureau, which is a loss maker, as is its Satellite Business Systems, the $300 million satellite communications firm of which IBM now owns 60%. Rolm Corp. was bought after two years of deteriorating financial performance, and its record is still insignificant when compared with the private branch exchange market leader AT&T. IBM also has a $300 million cellular radio network for internal use, which it has only recently begun to look at in commercial terms.

By the most optimistic estimate, telecommunications will bring in no more than $1.5 billion in revenue in 1985 — not much more than 3% of IBM's total revenue. As diversifications go, the area has not been too successful, and IBM is now trying to make something of it.

Last December, IBM created the nucleus of a new structure with its Telecommunications Products Organization. The company's game plan now seems to be to start leveraging the synergies among its various telecommunications operations and between these and its corporate systems business. During 1985, IBM is likely to start delivering "cradle-to-grave" communications offerings to large systems users, integrating its various on-site products and remote services under (what else?) SNA. Akers seems less interested in third-party tie-ups in this area than was his predecessor.

■ Marketing and distribution. After several years of allowing third-party distributors to undercut its direct sales forces, IBM now appears to be moving in the opposite direction. Clampdowns have begun on its various third-party Personal Computer distribution programs, and IBM also appears to be looking at restrictions on mid-range systems marketing through its value-added reseller program that would enable the company's direct sales forces to regain some of the ground they have lost to third-party distributors over the last few years.

A stronger direct sales effort for Personal Computers targeted at large systems users is clearly in the works, and IBM is even starting to give IBM product centers an edge in product pricing and availability over third parties.

Overall, the emphasis of the Akers regime seems to be that IBM should act more as a unified company and less as a conglomerate, exploiting market and product synergies more closely and favoring its direct sales forces more against the mass of third-party distributors it has signed on since 1981.

This new IBM backpedaling is already proving difficult for many in the industry to accept. When it comes to Personal Computers, for example, a whole new group of IBMers is now talking about such things as 3270 integration, the Distributed Office Support System and comprehensive electronic documents, and they are much less fond of third parties than Philip D. Estridge's Entry Systems Division team used to be.

Nightmares materialize

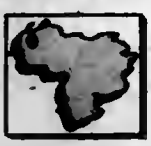
It looks as if IBM is finally going to start delivering on the nightmares that IBM peripheral, add-on and software vendors, as well as Personal Computer retailers, have been having for years about the company moving in on them, whereas large systems users who have used the Personal Computer anyhow for several years are going to start finding IBM laying down the law the way it has for other products and systems since the '60s.

It is also worth listening to what IBMers have been saying about increasing software revenue. IBM has started to field a much stronger host applications product line over the last few years, to compete with the independent software houses in the market, but it also looks as if IBM's policies with its Extended Architecture software will be extended.

Do you think this is an alarmist outlook? What would you do in Akers' place? You've committed to some ambitious growth targets and have told everyone about them. Yet, you are faced with deteriorating financial performance, slowdowns in critical markets, and your company is carrying a lot of relatively slow-growth, inefficient and, in some cases, loss-making deadwood.

An ambitious IBM has proved a dangerous competitor. A desperate IBM is going to be a lot worse. And Akers is going to be running IBM for 10 years.

Jeffery is director of research at International Technology Group, Inc., a Palo Alto, Calif.-based market research firm that focuses on IBM.



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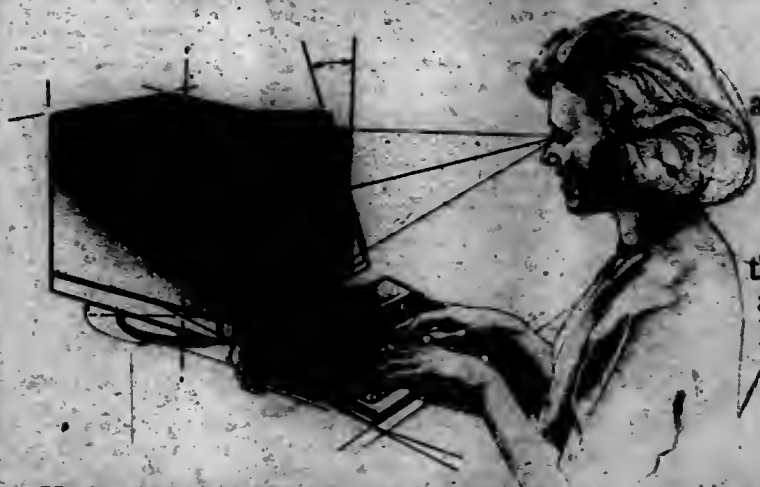

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PG02597

Miniscribe inks $20 million venture capital agreement

LONGMONT, Colo. — Disk drive manufacturer Miniscribe Corp., based here, recently announced a $20 million equity financing agreement with a venture capital group led by Hambrecht & Quist, Inc. The San Francisco-based investment banking firm was apportioned three of seven seats on Miniscribe's board of directors, including the new position of chairman.

Q. T. Wiles, chairman of Hambrecht & Quist, will become chairman of the board of Miniscribe in a move that increases the number of directors from six to seven. Two other Hambrecht & Quist executives added to the Miniscribe board were William R. Hambrecht and Ta Lin Hsu. As a result, Miniscribe said, current directors J. Wade Kennedy and Robert K. Anderson were expected to resign.

Continuing to serve as president, chief executive officer and a member of the board is Roger Gower, who was named to those positions in December after resigning as president of ITT Corp.'s Qume Corp. subsidiary. Miniscribe founder and former President Terry Johnson resigned at the time of Gower's appointment.

The company had previously announced that it would seek outside financing to shore up its cash shortage problems.

In early 1984, the company suffered a setback when IBM cut back on orders for disk drives for its Personal Computer XT.

In a recent interview, Miniscribe Vice-President Lawrence J. Klaszus said that the firm is determined not to become too dependent on any one customer in the future.

Miniscribe has moved most of its manufacturing offshore to the Far East, cutting its domestic full-time work force to 400.

Under the financing arrangement, Hambrecht & Quist will invest $8.5 million in Miniscribe. Miniscribe will privately place with the group of investors a series of preferred stock convertible into common stock at a price of $1.45 per share. Additionally, Miniscribe will issue five-year warrants to purchase 1.45 million shares of common stock at $1.60 per share and allocate those warrants to affiliates of Hambrecht & Quist, to Wiles and to members of the management team, the company said.

Honeywell to service Apple sites

CUPERTINO, Calif. — Apple Computer, Inc. said Honeywell, Inc. recently announced that Honeywell will provide third-party service for Apple's direct sales accounts.

As Apple's preferred service supplier, the companies said, Honeywell will offer service primarily to Apple's large corporate customers who use the Macintosh Office series. Honeywell's Customer Services division provides service and maintenance for Apple's entire product line as well as computer and communications products of other vendors.

Roy Weaver, vice-president of Apple's field operations, noted that Macintosh Office products are designed to connect and coexist in a multivendor environment. "It is important that the service organization working with Apple has the capability to support a wide variety of products and [the] expertise to meet the changing needs of businesses as office automation evolves," Weaver said.

Sy Kraut, vice-president of Honeywell's Customer Services division, said Apple customers will be able to obtain services from his division's network of 250 authorized service locations and a national service force of more than 3,700 people.

Announcing the NCC tour guide

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We'll also cover NCC in three special issues of Computerworld. The July 8th Preview issue. The July 15th Show issue. And the July 22nd Wrap-Up issue. Advertise in these issues and ensure your investment in NCC. And, just as importantly, you'll keep your name in front of more than 687,000 computer-involved professionals all during this eventful period.

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Issue	Issues Dates	Closing Date
NCC Daily!	July 15, 16, 17, 18	June 10 (all 4 issues)
NCC Preview	July 8	June 21
NCC Show	July 15	June 28
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AST reports quarter profits, revenue hike

IRVINE, Calif. — AST Research, Inc. reported fiscal third-quarter revenue of $37.8 million, up from $20.1 million in the first quarter of 1984.

Profits for the quarter ended March 31 were $5.8 million, or 55 cents per share, compared with $1.6 million, or 19 cents per share, in the year-earlier quarter.

The vendor of peripherals for IBM and other vendors' microcomputers said its results were aided by decreasing component costs and its own cost-reduction programs.

"These results reflect a strong demand for the company's recently introduced products, as well as higher volumes of the company's major products," AST President Safi Qureshey said.

AST primarily supplies peripherals for the IBM Personal Computer line as well as for micros made by AT&T and Apple Computer, Inc.

Stratus posts doubled revenue

MARLBORO, Mass. — Stratus Computer, Inc. reported that revenue doubled and profits more than doubled in the first quarter compared with the same three-month period in 1984.

Sales for the first quarter ended March 31 were $15.2 million, compared with $7.6 million in the prior year. Earnings were $1.5 million, or 8 cents per share, up from $676,000, or 4 cents per share, in the first quarter of 1984.

Stratus President William E. Foster said the results reflected market acceptance of the company's Stratus/32 fault-tolerant computer system.

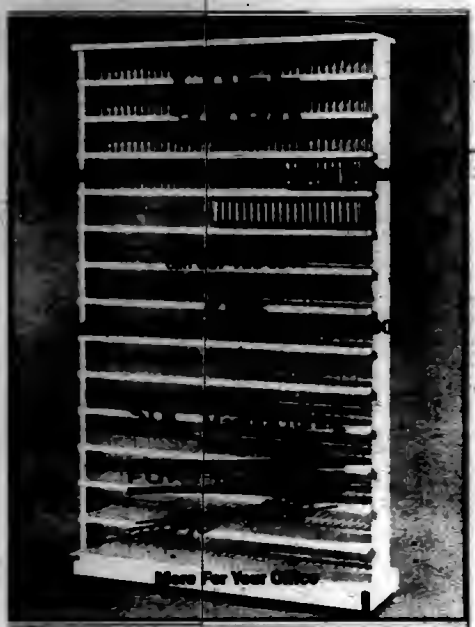
The company also announced two personnel changes at the executive level. Vice-President of Finance and Administration John H. Curtis has moved to vice-president of international operations and Corporate Controller Gary E. Haroian has been named treasurer and acting chief financial officer.

Tandem first-quarter sales rise 32%

CUPERTINO, Calif. — Tandem Computers, Inc. reported that first-quarter sales rose 32%, and profits more than tripled compared with the same quarter a year ago.

Tandem reported revenue of $146.5 million for the quarter ended March 31, compared with $111.2 million in the first quarter of 1984. Profits were $6.8 million, or 16 cents per share, compared with $1.9 million, or 5 cents per share, a year ago.

Tandem President James G. Treybig attributed the strong showing to wide market acceptance of the company's V-8 disk drive, introduced early in the quarter. Treybig said early customer response has also been favorable to Tandem's Nonstop EXT system.



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RELATIVE PERFORMANCE*	125	100	64	109
PRICE	$446,360	$707,897	$437,754	$656,989
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Relative Price Performance Index
*Computerworld, August 20, 1984

All systems are comparably configured with identical amounts of memory, disk space, and communication lines. But, only the Stratus price includes fault tolerance.

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Technology transition blamed for industry slump

By James Connolly
CW Staff

NAPA, Calif. — The slump that has clouded computer vendors' earnings is partly due to the industry passing through a transitional period toward a time when cost/performance ratios will favor smaller systems, according to a consultant who spoke here recently.

"What we are looking at is the beginning of the end of the first generation of information systems," said William F. Zachmann, vice-president of corporate research for Framingham, Mass.-based International Data Corp. (IDC), speaking at IDC's executive conference on office systems. Zachmann told 320 DP executives that departmental systems and micros finally have begun to replace mainframe-based systems.

Zachmann claimed that, while many people believe computers are in their fourth generation, those first four generations actually were blended into one. He said the levers for change in the next generation will include microcomputer emphasis, local-area networks, industry-accepted standards, user involvement and control and higher level interfaces.

The theory that a company should build the largest system it can to get the "most bang for the buck" no longer applies, Zachmann said. He adopted the "economy of small" philosophy of Austrian Phillip Ein-Dor, who said there is no longer an economy of scale as one moves into larger systems. Zachmann likened the changes now affecting the computer industry to the climactic changes that killed the dinosaurs and left room for smaller animals.

The "period of dislocation" could last two or three years and may impact mainframe-dependent IBM more than less-established companies, Zachmann predicted. The transition does not mean the end of mainframes or of IBM, but it does mean that sophisticated micros can be direct substitutes for in-house time-sharing systems based on mainframes that hold outdated, inaccurate and unusable data, Zachmann said.

Not necessarily inadequate

But IDC's director of microcomputer services, Aaron C. Goldberg, disagreed, saying that the central data base is not necessarily inadequate, that it usually is well maintained and well documented, even if it is based in a departmental system rather than in a mainframe. "The key job of the MIS department is to make sure [it] maintains an accurate, up-to-date data file," Goldberg noted.

He said there are micro-to-mainframe solutions available today, and that systems such as the Digital Equipment Corp. VAX-11 superminicomputer offer a tremendous amount of resources for the office. Those systems can operate as buffers, downloading more easily to 10 such mid-range systems than to hundreds of microcomputers, he said.

But Goldberg warned the attendees that computer vendors are circumventing them, trying to sell equipment and software directly to microcomputer users.

Meanwhile, Thomas H. Willmott, IDC's vice-president for user services, observed that the soft earnings of the computer industry are attributable to smart shopping and "user paralysis." He said the computer market has been slowed by the realization that many of the personal computer products that people read about are "much tougher to implement . . . than was the data center."

Willmott noted that single-function word processing systems of the later 1970s have been "blown from the water." Today's office system is based on a mid-range system, which can be a minicomputer-based system, a distributed processing system based on a micro-to-mainframe link, a local-area network utilizing a gateway to the host, a department-based minicomputer or a private branch exchange switched connection to a host computer.

Firm appeals Nasdaq action

ANAHEIM, Calif. — General Automation, Inc. announced that it has appealed the recent deletion of its stock from the National Association of Securities Dealers Automatic Quotation (Nasdaq) exchange system.

Nasdaq dropped General Automation's stock from its national over-the-counter trading system April 29 because the company's shareholders' equity fell below $375,000, the minimum required for Nasdaq listing. In the quarter ended Jan. 26, the company reported shareholders' equity of $275,000.

The vendor of industrial automation components and systems said it has reduced debt by $30 million during the past several years, restructured its management and operations, successfully introduced new products and redeployed nonmainstream assets. "The company's stability and progress should be gauged by a broader measure than simple shareholder equity," the firm said.

A decision on the appeal is expected in July.

INTELI

CAI vice-president resigns

BOULDER, Colo. — Bad news continued for Computer Automation, Inc. (CAI) with the resignation of its second top officer in two months and a first-quarter loss of nearly $1 million.

The company recently announced that Lee E. Hargrave Jr., executive vice-president and chief operating officer, will resign on May 17. Hargrave's resignation coincides with the move of the company's corporate headquarters here to Irvine, Calif. (CW, April 29). The move followed the April 1 resignation of CAI founder, President and Chief Executive Officer David H. Methvin.

CAI posted a loss of $945,000, or 46 cents per share, in the quarter ended March 31 on revenue of $12.7 million. The figure compares with a net loss of $1.3 million, or 64 cents per share, in the year-earlier quarter. The 1984 figure was helped by a non-recurring revenue gain of $1.2 million from the disposition of a lease on a CAI building in Irvine. That sale contributed to 1984 first-quarter revenue of $13.6 million.

In his resignation announcement, Hargrave said recent moves to streamline and consolidate the maker of minicomputers and minis made his position expendable. "A company of this size clearly does not need both a chief executive officer and a chief operating officer, as I have decided to move on to other challenges."

Computer Associates buys assets of Value Software

JERICHO, N.Y. — Computer Associates International, Inc. recently announced that it has acquired all the assets of Value Software, Inc. of Cherry Hill, N.J., an IBM systems software company specializing in operations management software packages for mainframe computer data centers.

Terms of the agreement will not be disclosed, the company said.

Value Software was bought because it has a good product line and an existing user base, a spokesman said. The firm is the third major IBM OS/MVS systems software company acquired by Computer Associates within the last three years. In August 1982, the company bought Capex Corp., maker of a Cobol optimizer program and other OS products, and acquired Johnson Systems, Inc., maker of job accounting products, in June 1984. It has also acquired smaller firms, such as Arkay, the developer of a product that converts code from IBM's DOS to OS, a spokesman said.

Computer Associates is retaining sales, support and development personnel and trying to place other staff members into its operations wherever possible, the company said.

The purchased company has been having financial difficulties for a while, the spokesman said. Value Computing, Inc. — as the company was known a year ago — was sold to Harvey Hansel, a private investor, in October 1984 when the name was changed to Value Software.

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Hogan ditches software plan

DALLAS — Hogan Systems, Inc. announced it has abandoned plans to develop software for international banking management and is seeking a buyer for the project. The decision means Hogan will close its International Systems Division office in New York and write off $5.7 million in unrecoverable development costs.

The write-off contributed to Hogan's dismal quarterly and annual fiscal results. Hogan posted a fourth-quarter loss of $10.7 million and revenue amounting to approximately one-third of the company's sales a year ago. Revenue for the period ended March 31 was $5.6 million, compared with $16.4 million in the year-earlier quarter. Hogan reported profits of $4.6 million in the first quarter of 1984.

For the fiscal year ended March 31, Hogan reported a loss of $12.5 million, or $6 cents per share, compared with profits of $7.1 million, or 55 cents per share, in the prior year. Revenue for the 12-month period dropped from $36.4 million to $28.2 million.

Hogan Chief Executive Officer Richard Streiter said development expenses for the international banking product line were too high for the company to continue the venture. He estimated the decision to drop the project will save Hogan $5 million per year.

Hogan purchased Henco Research, Inc. of New York in October 1983 and formed Hogan's international division to continue Henco's development of the management system for its international banking software line.

A Hogan spokeswoman said the product intended to integrate general ledger, foreign exchange, deposit and other software systems for banks with branches in several different countries.

Hogan will now concentrate on its software for domestic and foreign banks' in-country operations.

EDS to get Western Union's MIS

UPPER SADDLE RIVER, N.J. — Electronic Data Systems Corp. (EDS) of Dallas has signed a 10-year, $960 million contract to take over DP services provided by Western Union Corp.'s Management Information Services division.

Under terms of the agreement, all of Western Union MIS' approximately 170 salaried employees have been offered continued employment with EDS. The MIS operations are based in Mahwah, N.J., and satellite operations are located in Dallas and Maryland Heights, Mo.

Western Union Chairman and Chief Executive Officer Robert S. Leventhal said, "This contract assures that Western Union will have available to it the additional resources it requires in data processing necessary to support its growth in telecommunications. [The] agreement brings together the world's largest data processing service organization, EDS, with Western Union [in its] strong position as a national telecommunications company."

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communications lies not in newly developed products, but in older, established equipment. "Most people in the world still do not have a telephone," said Leo M. Paschall, chairman of American Satellite Co. "The big market out there is still plain old telephones, and I don't think the U.S. will get a piece of it. Lower cost providers will."

"We're so high tech, we forget that some of those countries are happy just to get a dial tone," said William Simpson, former manager of sales support for Mitel Corp., a Canadian vendor of telecommunications equipment and semiconductors.

Marketing, selling lag

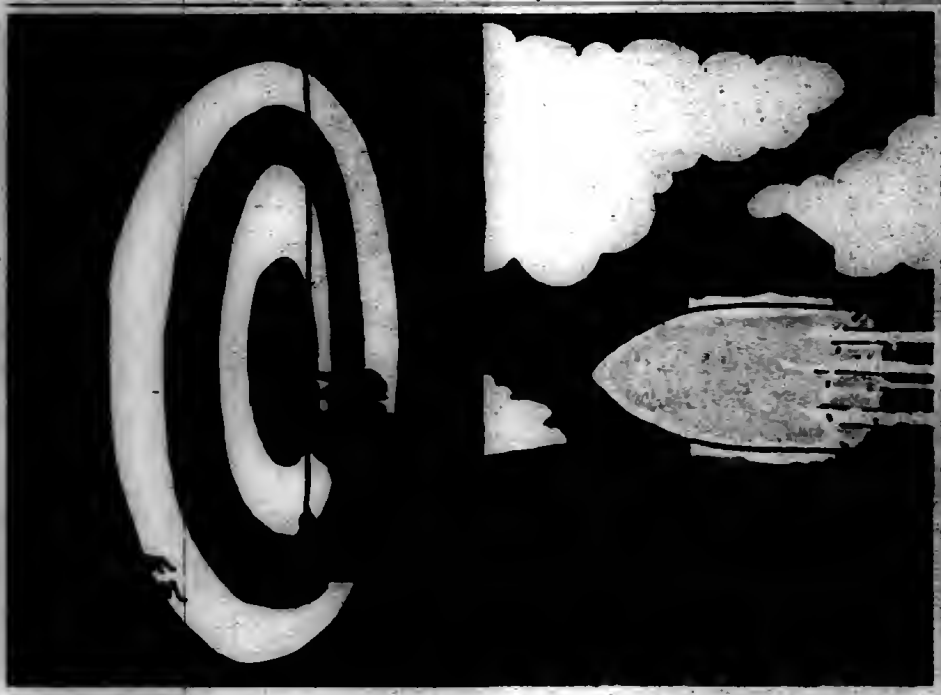
A former top-level AT&T executive, however, said that marketing and selling have always lagged behind technological development. "We've heard the same thing for years," said William G. Sharwell, once AT&T senior vice-president and now president of New York's Pace University. "Technology has always predated the marketing and financial means to sell it, but if the new product is compelling enough, the market will catch up. We're not doing as well as we can now, but time will take care of the problem."

Lack of understanding of foreign cultures and business patterns can also hamper the ability to trade, participants said. "European businesses think differently; there is much more focus on long-term relationships with specific companies," said Clay Whitehead, former White House communications policy adviser and current president of National Exchange, Inc., a maker of integrated services digital networks.

Several executives cited joint ventures with native firms as the answer, but Northern Telecom's Light suggested that such partnerships are not the only solution. "We have joint ventures in Korea and Taiwan, but we'll still be exporting, building our own plants overseas and licensing our technology to other countries," he said.

The head of a smaller antenna and transmission line firm said minimizing the American character of a company by hiring native executives in overseas offices and using native-made components helped his company in international markets, including Japan. "We keep a low profile, and it has worked," said Floyd English, president of the Orland Park, Ill.-based Andrew Corp. "From a financial standpoint, you can't make your components in the U.S. and ship them [overseas], regardless of the strength of the dollar."

America's best hope for exporting to Japan lies in telecommunications software, according to Ko Muroga, president of NEC America, Inc. "I don't think you're going to be able to make a cheaper switching system than the digital ones available now," Muroga said. "The important thing is developing software to best use those systems. In mainframe computers, 50% of the upgrade costs are for software and that [figure] may be 80% by 1990. Telecommunications will be the same."



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rism in 1982 against its member companies capitalizing software costs unless they had a previous record of doing so. Until a common standard was achieved, the SEC did not want the balance sheet of some software firms to reflect assets that were not included on others' balance sheets, according to Donald J. Kirk, chairman of Fasb.

The standard would apply to software developed for sale, lease or to be otherwise marketed. Software developed for internal use would not be covered by the proposed standard, according to Kirk.

While the board's proposal appears to be a compromise between the two methods, speakers at the first of two days of hearings tended to advocate one or the other.

"We essentially believe software is an asset and needs to be recognized as an asset for our industry to be taken seriously," said Adapso spokesman Lawrence J. Schoenberg, chairman of the board of Mountainside, N.J.-based AGS Computers, Inc., in recommending capitalization. Adapso is made up of companies in the software and services industry.

"It is an asset," agreed James C. Mendelsohn, software analyst with the securities brokerage house of Morgan Stanley & Co. in New York, "but it's not a predictable one."

Value difficult to tally

Mendelsohn claimed the special nature of software — its short life span, its evolving upkeep and its dependence on hardware frequently produced by other companies — makes it difficult to tally its value as an asset with a predictable payoff.

"When expenditures bear no value to the end product, accounting procedures have no validity," claimed Gerald I. White, a spokesman for the Financial Analysts Federation, a New York group of brokerage house analysts that also advocates expensing the development costs.

IBM's Wheeler, however, said neither the development process nor the end product were as unpredictable as its critics indicated.

As software has become key to successful, large systems, "the tools involved in software development have grown. . . . The process is defined and vigorously managed at each step," he said.

Fasb said a company must document the following for the costs of a planned software product to be called capital costs: its technological feasibility, an analysis of the projected market, a financial feasibility estimate and the company's management commitment to produce the product.

Asked if he thought such distinctions were workable, Burton Grad, a software consultant for Burton Grad Associates, Inc., and spokesman for Informatics General Corp. of Woodland Hills, Calif., said the criteria were awkward. Within a three-to-five-year period, companies will write specifications for a program and a machine will write the code, which means the Fasb criteria will come late in a development cycle, he said.

Compliance with the criteria would add a considerable expense to smaller companies' record keeping, said Charles Burg of the accounting firm Price Waterhouse & Co. in New York.

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its downward-heading counterpart for the overall economy and just wave as it goes by?

"Technology and the U.S. economy have exhibited a good deal more independence than most would have thought possible," said A. A. Tad LaFountain III, a former semiconductor analyst at Hambrecht & Quist in New York who recently hopped across the river to form his own research firm, LaFountain Research Corp., in Bay Head, N.J.

"When the tech cycle boomed, it coincided with a general downturn. Now technology is down, and the economy is up. That makes it practically impossible to calculate how things might turn out. In the old days, a down economy was it."

Cycle driven by products

What accounts for that economic independence? LaFountain and others believe the technology cycle is driven not by interest rates, budget deficits or the money supply, but by the technology itself — by products.

Harry Edelson of Saddlebrook, N.J.-based Edelson Technology Partners and formerly of First Boston, Inc. takes the principle one step further. He is a solid disciple of the IBM product cycle theory, which asserts that no economic factor affects Big Blue's bottom line as much as its own product announcements. In this case, he means the IBM Sierras, although the rumored PC2, whatever that might be, may also apply.

How much the industry leader's product cycle affects the overall high-tech economy is anyone's guess. Some theorists have every major DP budgeter holding his breath for the Sierra, but that seems to be unrealistic. If several major vendors have product lines in the offing, however, the product cycle theory appears to have some merit.

The bottom line, then, is that high technology remains relatively immune to traditional economic pressures. Certainly, Data General Corp. Chairman Ed de Castro was not wrong when he recently said, "If people aren't buying anything, products won't make a difference." But if the technology is needed (and equally important, correctly marketed), it will be purchased.

So while the high-tech industry continues to have plenty to worry about, renewed fears of a recession in the U.S. economy should not add that much to its menu of concerns.

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Seeking cream-of-the-crop software engineers for prestigious Northwest micro-processor software development firm. Ideal person will have 6R or MS in CS, math or EE and 3+ years experience as systems programmer developing data base, graphics, or language processors. "C" language helpful, also project lead experience.
To $60,000

SENIOR SBA

Seattle headquarters of architect, growing national firm seeks individual with 4+ years experience using DL/1 in a data base shop, plus CICS and COBOL. IMS preferred. Must have extensive data base design experience. Any exposure to relational data bases helpful — company plans to add state-of-the-art relational data base system over next few years.
High $30's

VM SYSTEMS PROGRAMMER

Pacific Northwest firm seeks individual with 2+ years sys-hare programming experience, including VM CMS, DOS/VSE, and CICS. DL/1 and VSAM extremely helpful. Will provide technical support to programming and operations staff; create, maintain, modify and implement operating system software.
To High $30's

LEAD ANALYST

Major Northwest corporation seeks analyst with 6-10 years DP experience, including 2-3 years banking applications and project management experience. Will be responsible for long range planning of systems architecture.
To mid $40's

COBOL P/A

Seeking individual with 1-5 years experience programming in COBOL in IBM OS/MVS shop. Banking or insurance applications experience necessary; IMS or BAL helpful.
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You'll be involved in information systems planning and assist in the preparation of financial or cost benefit analysis. Other duties include working with key users to coordinate and consolidate data processing needs and requirements and serving as liaison between data center and user community personnel. You'll also participate in preparation of short and long term plans. Degree in Computer Science and MBA or equivalent are required. You must also have 3-5 years experience in planning, administration or management in a large data center and have excellent communication skills.

Please send your resume to Kim Hawley, Amdahl Corporation, Dept. 65-602, P.O. Box 3470, 998/980, 1237 E. Arques Ave. Sunnyvale, CA 94088-3470. An equal opportunity employer.

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These positions require 5+ years' Network experience and will involve all aspects of nationwide data communications network, to include the design, implementation, modifications/enhancement, and trouble shooting. Technical skills should include: LAN, X.25, SNA. Work experience with PRIME computers and INFOTON products are a definite plus.

For immediate consideration, please send your resumé in confidence to: Human Resources, MCI Telecommunications Corporation, 701 South 12th Street, Department LMS-5, Arlington, VA 22202. An Equal Opportunity Employer M/F/H/V.

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SYSTEMS MANAGER

Office of Computing Services

Morehead State University is seeking qualified and experienced candidate for the position of Systems Manager in the Office of Computing Services. The position is responsible for the operations of the mainframe and minicomputer systems which support a Prime 750, and Prime 850 II. Duties include installation and utilization of the PRIMOS and information software; reviewing systems documentation and user requests; evaluation and installation; maintaining inventories of equipment and supplies; daily systems back-up; liaison with maintenance contractors; programming and user support; supervising the development of policy and procedures; documentation of operating procedures; supervision of the Coordinator of Technical Services and the Coordinator of Administrative Services. Qualifications include: Bachelors degree required and preference will be given to those who have technical experience with an integrated and interactive information system on a Prime computer and who are knowledgeable of COBOL, FORTRAN and BASIC. A highly motivated and self-directed individual is sought. Send letter of application, resume and at least 3 references no later than June 1, 1985 to: Division of Payroll and Personnel.

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Data Processing

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Contact Gary Hunt for specific information about these Senior positions:

PROJECT LEADERS

Responsible for assisting software development managers with definition and implementation of tasks in software project planning, procedures, Unit Development Folders, proposal writing and cost estimation of government-type programs. BSCS, EE or Math with six plus years experience. Experience with VAX, PASCAL and MIL-SPEC standards required. These individuals will eventually assume roles in software management.

SENIOR SOFTWARE ENGINEERS

Responsible for implementing the tasks defined below on software development projects. These engineers will report to project leaders. BSCS, EE or Math with six plus years experience in definition, design, development and delivery of software systems, utilizing VAX or Motorola 68000 computers. Required fluency in PASCAL, structured FORTRAN, MACRO-11 or Assembly languages. Experience with MIL-SPEC standards required.

SENIOR VMS SPECIALISTS

Responsible for definition, development and enhancement of software development environment on VAX systems, BSEE (MS) or CS with seven plus years related experience with VAX systems in PASCAL fluency required. Must be VMS internalist within I/O driver systems. Defense environment background a plus.

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SOFTWARE ENGINEER

Responsible for design, coding, and testing of systems level software. Position requires minimum of BSCS or BSEE degree with at least two or more years experience with the VAX 11/750 or 780 and VMS operating systems. Experience in one or more of the following areas is desirable: MIL-Standard documentation, UYK series computers and real time signal processing architecture.

BUSINESS PROGRAMMER ANALYST

Responsible for development and maintenance of on-line systems in an IBM OS/MVS IDMS CICS environment. Must have a college degree in Business, MIS or related field, and three to five years experience developing/maintaining on-line systems, supporting Accounting, Manufacturing or Purchasing/Inventory control.

DATA BASE ADMINISTRATOR

Responsible for the installation of IDMS in an IBM OS/MVS environment, for the design and maintenance of the data base and related data dictionary, and for the development and enforcement of standards and procedures for its usage. Requires a college degree and three-to five years data base Design/Administration experience.

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You will define controls and provide methods for assuring software product quality and requirements compliance. You will also implement and report software quality assurance activities that verify quality aspects of software. Requires experience with DoD software in areas of development, tests or software quality assurance and knowledge of MIL-S-52779A and DOD-STD-1679A. B.S. degree in engineering or computer science preferred or equivalent combination of formal education and relevant experience.

Please send your resume to: Director-Quality Assurance, General Dynamics Convair Division, MZ 11-1342-1013, P.O. Box 85357, San Diego, CA 92138.

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Data Processing

I D M S

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- PROGRAMMER/ANALYST
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SYSTEMS PROGRAMMER

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Support CICS/VM clients using this dual computer, running CMS/VM. Requires: B.S. in CS or related experience. Demonstrated working knowledge of IBM BAL and FORTRAN programming. Knowledge of Prolog, SAS/GRAPH and CICS/VM related software. Two years experience. Salary Range: $16,000 to $20,000/year. To be current position: available July 1, 1985. Send resume, names of three references by July 1, 1985 to Personnel Office, UAC 84.

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Openings are available for this position throughout the United States to install and maintain sophisticated telecommunications equipment. You must have an AS degree or equivalent in Computer Technology or Electronics, a knowledge of earth stations and switching nodes, (Tandem and/or Rockwell/Collins equipment preferred), and familiarity with communications protocols such as X.25 and HDLC. Practical knowledge of voice grade and DDS data circuits is also required.

SR. TECHNICAL ANALYST/ NETWORK OPERATIONS

You will provide maintenance and diagnostic technical support to isolate and resolve component and system problems; formulate and document operational procedures. You must have a Bachelor's degree or equivalent in Computer Science or Electrical Engineering. Five years professional experience in field maintenance/repair/technical support of high technology computer, microprocessor, office products and/or telecommunications systems is required along with strong interpersonal skills.

PROJECT ENGINEER/ IMAGE PROCESSING

You will develop data compression and image processing strategies and provide technical expertise in the design of advanced image processing systems and data compression. A Bachelor's degree or equivalent in Engineering, Mathematics, Physics or Computer Science is required. A Master's degree is preferred. You must have 7 years professional experience in data compression technology, including 3 years experience in image processing research and analysis.

SR. ENGINEER/DATA NETWORKS

You will participate in the planning, design and engineering of data networks. A BS in Electrical Engineering, Computer Science, Telecommunications or equivalent is required along with 4 years experience in any of the following areas: network planning and analysis; SNA network implementation; network engineering using concentrators and multiplexers; network architecture (X.25, SNA, IEEE 802); or communications software development. Experience in computer programming is preferred.

SR. TECHNICAL ADVISOR/ SWITCHING SYSTEMS SOFTWARE

You will develop telecommunications strategies and provide technological expertise and planning to support existing and corporate objectives; ensure cost-effective networking and cost control of network/systems. A Bachelor's degree or equivalent in Engineering or Computer Science is required. Master's degree is preferred. You must have a minimum of 10 years professional experience in data communications network design and analysis. An in-depth knowledge of micro-processor hardware and software, including "C" and Assembler languages is required along with strong organizational, analytical, planning, human relations and communications skills.

SR. TECHNICAL ADVISOR/ PACKET SYSTEMS DESIGN

You will develop telecommunications strategies and provide technological expertise and planning to support existing and planned corporate objectives; ensure cost-effective networking and cost control of network/systems. A Bachelor's degree or equivalent in Engineering or Computer Science is required. Master's degree is preferred. You must have a minimum of 10 years professional experience in data communications network design and analysis. An in-depth knowledge of micro-processor hardware and software, including "C" and Assembler languages incorporated in packet switching design is required along with strong organizational analytical, planning, human relations and communications skills.

TECHNICAL ADVISOR/ NETWORK DEVELOPMENT

You will be an authority in the area of telecommunications in performing research, analysis and design of advanced telecommunications systems, thereby ensuring that the most cost-effective systems are consistent with traffic requirements and minimizing expenditures for equipment and services. A Bachelor's degree or equivalent in Engineering, Mathematics, Physics or Computer Science is required along with 7 years professional telecommunications experience. Experience must include 3 years in communications research and analysis with background in traffic engineering, computer architecture, and network modeling. Strong human relations and communications are essential.

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RPG III Programmer/Analyst — Fortune 500 Company *(90I-04)* One of the most secure, highly respected, Boston-based Fortune 500 companies seeks an RPG III professional. Company rarely needs to hire "from the outside." This is your chance to work in a leading edge environment and travel internationally on occasion. Two or more years of RPG experience with exposure to RPG III sought. To $35,000.

COBOL Programmer — John Hay Boston Financial Firm *(90I-03)* Unusual opportunity for a relatively junior level person to join one of Boston's top financial organizations. Will have chance to grow into either highly technical responsibilities or management. One year of IBM COBOL and either DOS or OS/JCL desired. To $24,000.

Decision Support Analyst — Boston Financial District *(90I-07)* Executive group of a major Boston-based financial organization is developing automated management tools to support major corporate business strategies. Two or more years of diverse computer experience sought; including high level languages such as FOCUS, RAMIS, or NATURAL, using either TSO or VM/CMS. Degree required. To $35,000.

Programmers — Near Boston Waterfront *(90I-08)* Small specialized division of a major Boston employer will provide training in CICS. Two top people sought for this pilot program. Skills and experience needed include one or more years of IBM COBOL and any of the following: MVS, VM, VSAM, DL/I or CICS. To $31,000.

C/UNIX Professionals — Near Route 128, Flexible Hours *(90I-09)* Boston-area C/UNIX "start-up" (founded by a software professional who has started and currently owns other successful computer-related businesses) seeks two persons. Firm offers competitive salary, equity position, 100% flexible hours, a stimulating peer group and accountability by car or public transportation. Any C/UNIX experience considered. To $30,000.

IDMS Professionals *(90I-10)* Permanent staff positions and contract/hourly positions are available with well-known Boston area supplier of high level consulting service. Four or more years experience with IDMS as a Programmer, Programmer/Analyst, Systems Programmer or Data Base Analyst sought. To $70,000.

Sales/Product Marketing Manager — Boston Vice Presidency *(90I-12)* Well-established New England software vendor seeks Sales Manager to supervise Sales Representatives and telemarketing function. Position can lead to Vice President. Three or more years of highly successful small systems sales from a computer vendor (preferably IBM), knowledge of manufacturing system requirements, aggressive personality and a BS/BA degree sought. Compensation = Basic + Bonuses. To $100,000.

Senior DOS/VS Systems Programmer — Learn VM and MVS *(90I-13)* Highly prestigious manufacturer of high tech computer products seeks Senior Systems Programmer. Excellent chance for a talented DOS/VS Systems Programmer to expand technical knowledge and future career opportunities. Five or more years experience, solid BAL capability and some exposure to CICS or data communications preferred. To $42,000.

COBOL Programmer — Wang VS *(90I-14)* Major consulting firm with a worldwide reputation for employing some of the top engineering and computer talent seeks COBOL Programmer. Company uses many different computers including Wang, IBM and DEC which provides an excellent learning environment for all computer staff. Two or more years experience using a major mini computer (preferably the Wang VS) and a four year college degree sought. To $30,000.

Software Engineers *(90I-15)* Major Boston area communications firm provides opportunity to learn communications software. These positions offer the non-communications experienced Software Engineer the opportunity to learn valuable software development skills. Two or more years of real time Assembler programming experience preferred. $28,000 to $40,000.

IBM/VM Systems Programmer — Full relocation to Vermont *(90I-16)* Growing firm seeks System Programmers to perform a complex VM installation on the IBM 4381. As one of two Systems Programmers, will learn to support IDMS immediately and MVS in 1986. One or more years IBM/VM experience desired. To $35,000.

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Senior Sales Representative — Management Potential *(90I-20)* Boston suburbs-based data processing service organization seeks an experienced sales professional who is familiar with the IBM product line to become Manager. Base to $35,000 ($75,000 at 100%).

Applications Programmer — IBM Training Provided *(90I-21)* Boston-based international manufacturer/distributor seeks experienced COBOL Programmers to participate in new applications development. IBM COBOL experience desired. To $28,500.

Programmer/Analyst — Rapid Advancement Potential *(90I-22)* Prestigious New England consulting firm specializing in major data base/data communication systems development seeks a Programmer/Analyst with three or more years experience in IMS, IDMS, CICS or TOTAL and COBOL. To $40,000.

Senior Programmer/Analyst — New Data Base Opportunity *(90I-23)* Major new on-line data base installation seeks Senior PA with three years of data base design experience using IMS, ADABAS or IDMS. Boston area. To $42,000.

Systems Analyst — Become a Data Base Analyst *(90I-24)* Major retailer seeks person to function as a Technical and Design Advisor to group of thirty-two Programmers/Analysts and Project Leaders. Implementing DB/DC systems. Four or more years in the design and programming of data base systems desired. To $45,000.

Minicomputer Programmer/Analysts — New Development *(90I-25)* New England-based computer manufacturer needs Programmer/Analysts to install both MIS and real-time manufacturing systems. Seek mini-computer Programmers experienced in COBOL or Assembler programming. To $36,500.

Systems Programmer — Premier IBM Data Center *(90I-26)* Multiple CPU, MVS/IMS, DB/DC data center seeks System Programmer for tuning and internal consulting for performance maintaining. Three years of MVS, Data Base and IMS preferred. To $40,000.

Software Engineers/Programmers — Telecom/Data Communications *(90I-27)* Fast-growth company is developing exciting new technology. Three years experience programming in C and Assembler under UNIX or RSX-11M preferred. Package includes stock. To $45,000.

Programmers and Analysts — New England Coast *(90I-11)* Major IBM data center seeks several professionals. Will learn IDMS and CICS through both formal and on-the-job training. IBM COBOL and MVS experience sought. In addition to top salaries, and the most up-to-date technology, firm will also consider paying for relocation if you live more than 35 miles from the coast. $24,000 to $40,000.

Southern New England

Internal Consultant — Distributed Processing *(90I-01)* Fortune 500 organization in Connecticut seeks an Internal Consultant with applications and technical experience using IBM 8000 Series 1 and Wang mini-computers. Will work with different applications groups. High exposure visibility. To $42,000.

Programmer/Analyst *(90I-03)* Multidivisional Fortune 500 manufacturer seeks professionals with two years IBM OS/COBOL programming and analysis experience. Position entails development and support of financial and manufacturing systems, using COBOL with CICS and DL/I. Great Connecticut location. To $28,000.

Lead Senior Analyst — Management Visibility *(90I-04)* Suburban Hartford employer seeks individual to develop a new business system. Four or more years large scale IBM COBOL applications development preferred. To $34,000.

Systems Analyst — FOCUS *(90I-05)* Major Hartford employer seeks professional for high visibility project. Will develop new financial systems. Three years of data base design and programming experience with FOCUS helpful. To $34,000.

Senior Software Engineer — New Professional Opportunity Join dynamic team with state-of-the-art technology. Will be responsible for real-time data-loop test applications, including environmental chambers and satellite control systems. IBEE or IBCE and three years programming and design with Intel 8080, Z-80 or Motorola 6800 preferred. To $40,000.

Marketing Representative — $100,000 or Quota *(90I-08)* Major software services firm seeks Sales Representative with five or more years experience selling to large scale IBM commercial accounts. Will market consulting services and proprietary software packages. Salary and commission is $100,000 or quota. $60,000 guaranteed.

Programmer/Analyst *(90I-09)* Major Hartford financial institution seeks professional who will join their high visibility BH group. One or more years experience in IMS DL-1 and DB/DC a plus. Large scale IBM experience preferred. Will provide technical support for new development system. To $29,000.

Programmer — Major Firm *(90I-10)* Major Hartford employer seeks a Programmer with one or more years experience. Extensive technical education provided! Will have direct contact with both user and systems personnel. MVS, JCL, TSO/CMS and associated software experience desired. Good communications skills needed. To $26,000.

Systems Engineers *(90I-11)* Major Connecticut employer needs three individuals with eight or more years of systems design experience. Will be part of a ten person team that is redeveloping a 2,000 module base business application. A strong background in DB/DC and structured methodologies desirable. To $40,000.

Systems Analyst — MIS Professionals *(90I-12)* Expanding financial organization seeks senior individual with five or more years of IBM 370/OS, COBOL, and CICS experience that includes the installation and conversion of MIS Products. Opportunity for promotion to Project Leader within one year. To $37,000.

Senior Software Engineer *(90I-13)* Major international manufacturer seeks Microcomputer Programmer with C language experience in a UNIX environment to support laser printer technology. IBEE. Assembler experience and knowledge of BASCAL and FORTRAN desired. To $55,000.

Systems Programmer *(90I-14)* Major educational institution seeks MVS professional to support VS-1 to MVS conversion, trouble-shooting, system tuning, etc. Two or more years of OS/MVS experience desired. Prefer VM/CMS and COBOL exposure. CICS a plus. Excellent benefits. To $30,000.

Programmers — Multiple Openings *(90I-15)* Outstanding opportunity at Fortune 100 client sites in Connecticut for Programmers with two or more years of IMS DB/DC experience. Opportunity to work on key data base development projects. To $35,000.

Software Engineers *(90I-01)* Major Connecticut-based firm seeks Software Engineers to research and develop diverse mini/micro-based, on-line, real-time distributed systems. Opportunity to be a Group Leader or Supervisor. To $54,000.

Software Professionals — Develop Microcomputer Software Tools *(90I-02)* Start-up department in Connecticut seeks professionals to develop tools for use by a variety of mini-computer and microcomputer users. One or more years of Assembler, C and experience in the development of systems sought. UNIX knowledge a plus. To $44,000.

Systems Engineers — Sales Training *(90I-03)* Major high tech vendor is opening new branch in Southern Connecticut. No travel. Chance to manage large sales after one year. To $40,000 plus much.

Senior Analyst — Become #Two Systems Person *(90I-04)* New data center in Southern Connecticut seeks individual to participate in systems planning, design, development, project control. Background should include five or more years of programming and systems development — preferably in an on-line or data base environment. To $41,000.

Software Engineer — Technical and management growth opportunity. *(90I-05)* Internationally-known information service company seeks Engineers to develop on-line real-time mini/micro-based systems. To $40,000.

Programmer/Analysts *(90I-06)* Big 8 consulting firm is staffing new internal systems development group with degreed experienced Programmers and Analysts. Fast track potential for project and systems management. Three or more years of mainframe COBOL or PL/I exposure sought. Connecticut location. To $35,000.

Project Leader *(90I-07)* Opportunity for Senior Analyst or Programmer to head new project team which is beginning analysis of new on-line financial and decision support applications. Southern Connecticut. To $36,500.

Senior Programmer/Analyst *(90I-08)* Implement business systems for this fast growing company in Connecticut. Three or more years of IBM system 36 RPG III preferred, but strong System 34 manufacturing experience will be considered. To $30,000.

Project Leader *(90I-10)* Will direct staff of six Programmer/Analysts and two Analysts in the development of on-line data base distribution and manufacturing system. Prior programming background helpful. To $38,000.

Programmer/Analysts — Learn CICS/DL-1 *(90I-17)* Major Fairfield County firm seeks IBM/COBOL Programmer/Analysts with two or more years of exposure to distribution or financial systems. Will learn on-line database. To $32,500.

MIS Director *(90I-20)* Headquarters in lower Fairfield County needs an MIS professional to direct all data processing for this Fortune 500 company. Previous IBM systems management sought. To $75,000.

Tech Services Group — Systems Programmer *(90I-14)* Ground floor opportunity to head the Tech Services Group of a new division. Environment will be 3081 OS/MVS, IMS and CICS. Will hire own staff of four Systems Programmers. Two years OS/MVS, DL-1 or CICS experience sought. To $45,000.

CAD/CAM Programmers *(90I-15)* Connecticut shoreline company actively involved in R&D of sophisticated design engineering, automated manufacturing, robotics and automated test systems seeks CAD/CAM Programmers. To $40,000.

Systems Analyst — Move up to Project Manager *(90I-16)* Lower Connecticut communications firm needs a Senior Systems Analyst to review, design and implement an on-line CICS-driven, corporate-wide information system. OS/COBOL background needed. To $42,000.

Manager of Software Engineering — New Development *(90I-19)* Major R&D division of leading firm seeks Software Engineer with supervisory skills. UNIX, C or PASCAL, and M68000 backgrounds. To $52,000.

Programmer/Analysts — IMS Training *(90I-21)* Leading edge user of IMS DB/DC design seeks several individuals for application development, data dictionary, DB/DC design and technical support. Two years IBM 370/OS COBOL or BAL experience with exposure to DB/DC preferred. To $31,000.

Systems Programmers *(90I-13)* Fortune 50 financial organization seeks individuals with two years experience in MVS, IMS or TCAM internals. Excellent opportunity for advancement. To $36,000.

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The CAREER Symposium

May 21st & 22nd
12 pm to 9 pm
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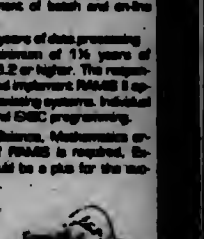

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SYSTEMS	MIPS	MIS/MIPS
4381-1	0.38	0.5 to 1
4381-11	0.38	1 to 2
4381-2	0.68	1 to 2
4381-3	0.68	1 to 2
4381-12	0.75	2 to 4
4381-13	0.82	2 to 4
4381-11	1.1	2 to 4
4381-1	1.15	2 to 4
4381	1.2	2 to 4
4381-14	1.25	2 to 4
4381-2	1.3	2 to 4
4381-12	1.35	2 to 4
3084QP	2.9	2 to 4
3084-1	3.1	2 to 4
3084	3.2	2 to 4
4381-2	2.7	4 to 8
3083	3.4	4 to 8
4381CX	3.5	4 to 8

SYSTEMS	MIPS	MIS/MIPS
4381-3	3.6	4 to 8
3083E	4.2	4 to 8
3083B	4.4	4 to 8
3084-2	4.5	4 to 8
3084-3	5.2	4 to 8
3084-13	5.4	4 to 8
3084-23	5.6	4 to 8
3084-14	5.8	4 to 8
3084-24	6.0	4 to 8
3084-4	6.2	4 to 8
3084CX	6.4	4 to 8
3084-15	6.6	4 to 8
3084-25	6.8	4 to 8
3084-5	7.0	4 to 8
3084-16	7.2	4 to 8
3084-26	7.4	4 to 8
3084-6	7.6	4 to 8
3084-17	7.8	4 to 8
3084-27	8.0	4 to 8
3084-7	8.2	4 to 8
3084-18	8.4	4 to 8
3084-28	8.6	4 to 8
3084-8	8.8	4 to 8
3084-19	9.0	4 to 8
3084-29	9.2	4 to 8
3084-9	9.4	4 to 8
3084-20	9.6	4 to 8
3084-30	9.8	4 to 8
3084-10	10.0	4 to 8
3084-21	10.2	4 to 8
3084-31	10.4	4 to 8
3084-11	10.6	4 to 8
3084-22	10.8	4 to 8
3084-32	11.0	4 to 8
3084-12	11.2	4 to 8
3084-33	11.4	4 to 8
3084-34	11.6	4 to 8
3084-35	11.8	4 to 8
3084-36	12.0	4 to 8

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AS/6040	5.2	8 to 16
AS/6060	8.5	8 to 16
AS/6080	11	8 to 16
AS/6120	7.2	8 to 16
AS/6060	8	8 to 16
AS/6080	11.2	8 to 16
AS/6070	16.2	16 to 64
AS/6090	20	16 to 64
1400/25_40	25	32 to 256
1400/25_60	30	64 to 256

*Final installation 1987

The above information is intended as a guideline for computer users and data processing system administrators only. All data have been derived from published sources and from individual research and are the property of Randolph. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware/software configurations, and system performance can normally modify computer models as does high-speed cache in hardware and software sales.

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General Request for Proposal No. 1694, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of telecommunications equipment for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1695, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of video display word processors and peripherals for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1696, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of shared logic word processing systems and peripherals for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1697, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of shared data entry systems for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1698, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of IBM System 34, 36, and 38 compatible devices for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1699, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Burroughs compatible devices for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1910, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Unisys compatible terminals, printers, controllers, and equipment for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1911, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Four Phase compatible devices for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1912, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Honeywell compatible devices for the State of Mississippi during fiscal year 1986.

Request for Proposal No. 1914, due Thursday, June 13, 1985, for the acquisition of an on-line turnkey system with hardware, software and services for the BUREAU OF MARINE RESOURCES, Long Beach, Mississippi.

Request for Proposal No. 1916, due Tuesday, May 28, 1985, for a minicomputer system for ALCORN STATE UNIVERSITY, Lorman, Mississippi.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals.

Lisa Woodard or Elaine Rogers, Mississippi Central Data Processing Authority
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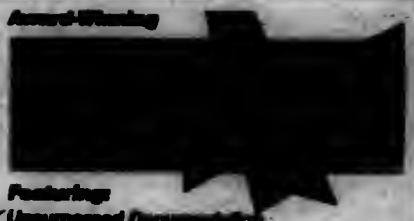

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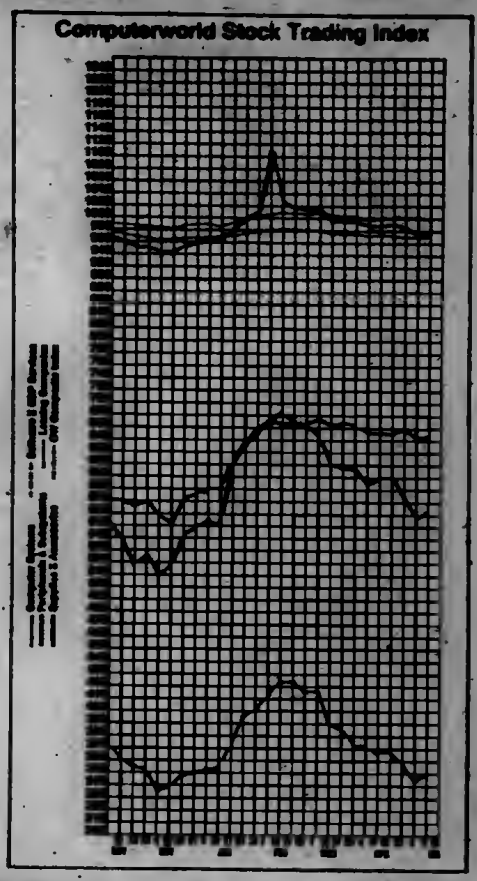
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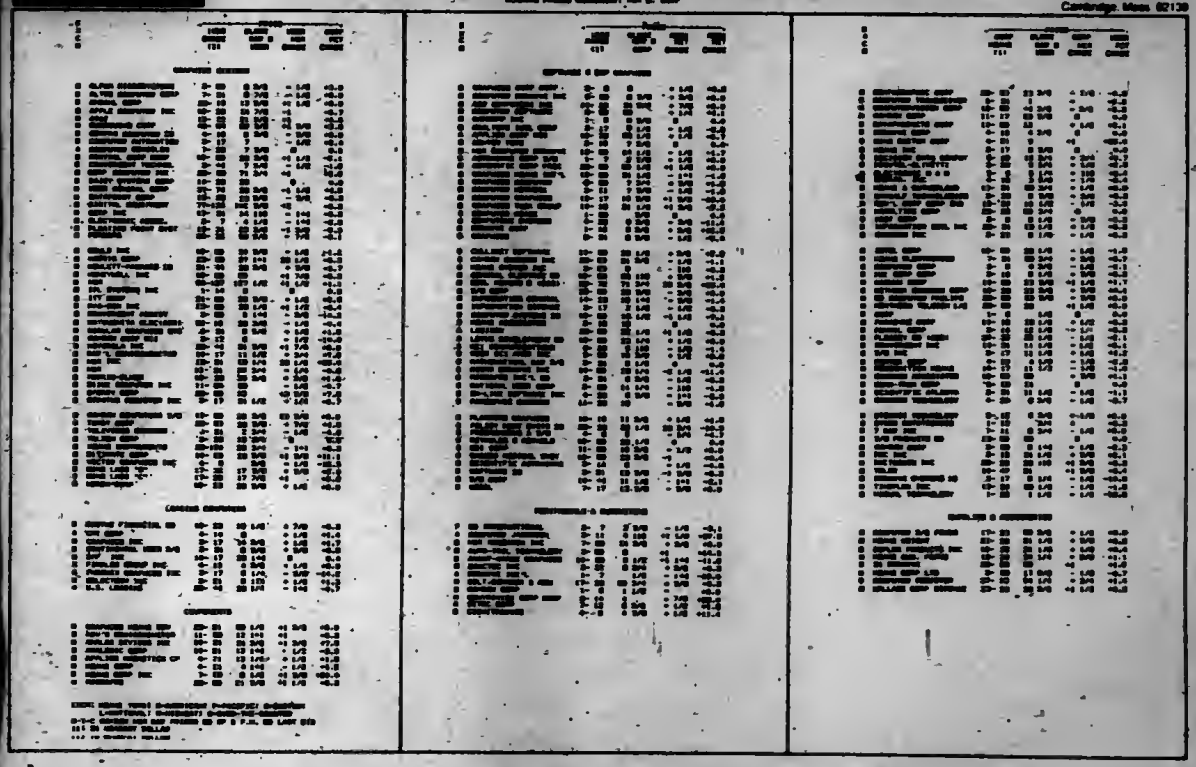

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